

# Tactical Combat Casualty Care



November 2010



## Tactical Field



# Objective S

- **STATE** the common causes of altered states of consciousness on the battlefield.
- **STATE** why a casualty with an altered state of consciousness should be disarmed.
- **DESCRIBE** airway control techniques and devices appropriate to the Tactical<sub>2</sub>Field Care phase



# Objectives

- **DEMONSTRATE** the recommended procedure for surgical cricothyroidotomy.
- **LIST** the criteria for the diagnosis of tension pneumothorax on the battlefield.
- **DESCRIBE** the diagnosis and initial treatment of tension pneumothorax on the battlefield.



# Objectives

- **DEMONSTRATE** the appropriate procedure for needle decompression of the chest.
- **DESCRIBE** the progressive strategy for controlling hemorrhage in tactical field care.
- **DEMONSTRATE** the correct application of Combat Gauze.



# Objectives

- **DEMONSTRATE** the appropriate procedure for initiating a rugged IV field setup.
- **STATE** the rationale for obtaining intraosseous access in combat casualties.
- **DEMONSTRATE** the appropriate procedure for initiating an intraosseous infusion



# Objectives

- **STATE** the tactically relevant indicators of shock in combat settings.
- **DESCRIBE** the pre-hospital fluid resuscitation strategy for hemorrhagic shock in combat casualties.
- **DESCRIBE** the management of penetrating eye injuries in TCCC.
- **DESCRIBE** how to prevent blood clotting problems from



# Objectives

- **DESCRIBE** the appropriate use of pulse oximetry in pre-hospital combat casualty care
- **STATE** the pitfalls associated with interpretation of pulse oximeter readings
- **LIST** the recommended agents for pain relief in tactical settings along with their indications, dosages, and routes of administration
- **DESCRIBE** the rationale for early



# Objectives

- **LIST** the factors involved in selecting antibiotic drugs for use on the battlefield.
- **DISCUSS** the management of burns in TFC
- **EXPLAIN** why cardiopulmonary resuscitation is not generally used for cardiac arrest in battlefield trauma care.
- **DESCRIBE** the procedure<sup>8</sup>for documenting TCCC care with the





# Objectives

- **DESCRIBE** the appropriate procedures for providing trauma care for wounded hostile combatants.



# Tactical Field Care

- Distinguished from Care Under Fire by:
  - A reduced level of hazard from hostile fire
  - More time available to provide care based on the tactical situation
- Medical gear is still limited to that carried by the medic or unit members (may include tactical vehicles)





# Tactical Field Care

- May consist of rapid treatment of the most serious wounds with the expectation of a re-engagement with hostile forces at any moment, ***or***
- There may be ample time to render whatever care is possible in the field.
- Time to evacuation may vary from minutes to several hours or longer



# Battlefield Priorities in Tactical Field Care Phase

- This section describes the recommended care to be provided in TFC.
- **This sequence of priorities shown assumes that any obvious life-threatening bleeding has been addressed in the Care Under Fire phase by either a tourniquet or self-aid by the casualty.**
- **If this is not the case - address the massive bleeding first.**
- After that - care is provided in the sequence shown



# **Tactical Field Care Guidelines**

- 1. Casualties with an altered mental status should be disarmed immediately.**



# Disarm Individuals with Altered Mental Status

- Armed combatants with an altered mental status may use their weapons inappropriately.
- Secure long gun, pistols, knives, grenades, explosives.
- Possible causes of altered mental status are Traumatic Brain Injury (TBI), shock, hypoxia, and pain medications.
- Explain to casualty: “Let me hold



# **Tactical Field Care Guidelines**

## **2. Airway Management**

### **a. Unconscious casualty without airway obstruction:**

- Chin lift or jaw thrust maneuver**
- Nasopharyngeal airway**
- Place casualty in recovery position**



# **Tactical Field Care Guidelines**

## **2. Airway Management**

### **b. Casualty with airway obstruction or impending airway obstruction:**

- Chin lift or jaw thrust maneuver**
- Nasopharyngeal airway**
- Allow casualty to assume any position that best protects the airway, to include sitting up.**
- Place unconscious casualty in recovery position.**
- If previous measures unsuccessful:**





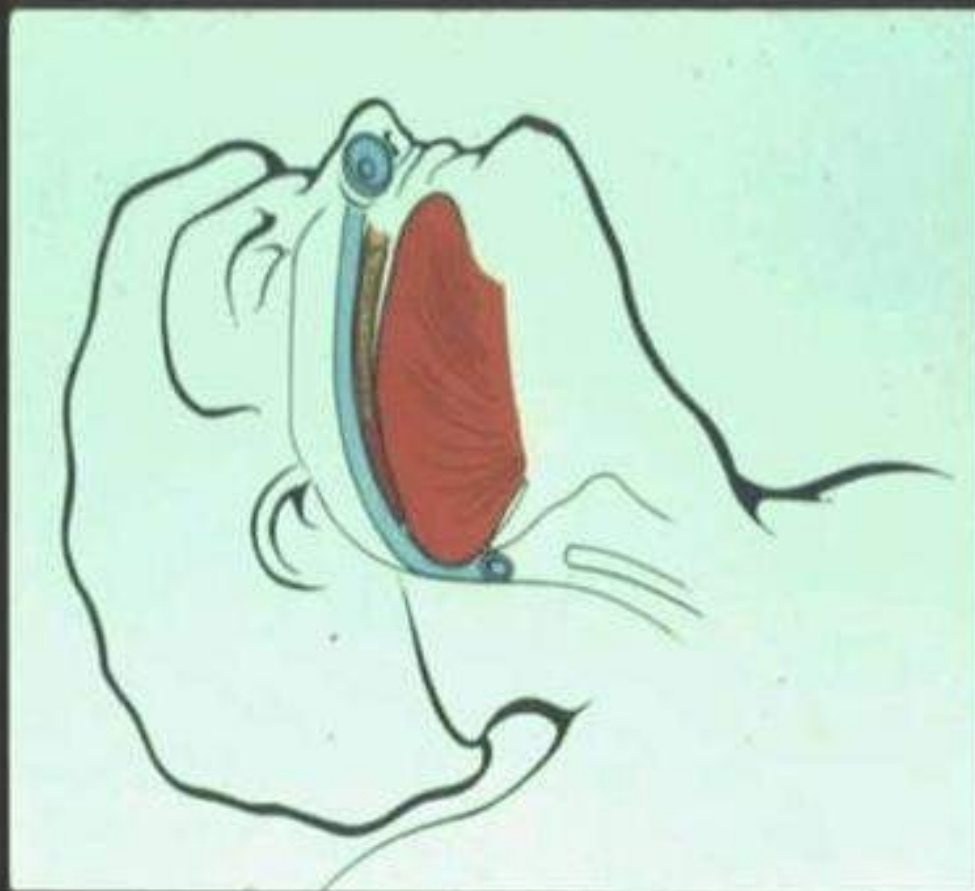
# Nasopharyngeal Airway

- The “Nose Hose,” “Nasal Trumpet,” “NPA”
- Excellent success in GWOT
- Well tolerated by the conscious patient
- Lube before inserting
- Insert at 90 degree angle to the face  
NOT along the axis of the external nose
- Tape it in
- Don’t use oropharyngeal airway (‘J’ Tube)
  - Will cause conscious casualties to gag



# Nasopharyngeal Airway

- **Lubricate !**
- **Insert along floor of nasal cavity**
- **If resistance met, use back-and forth motion**
- **Don't Force – Use other nostril**
- **If patient gags, withdraw slightly**





# Nasopharyngeal Airway



**What's wrong with this NPA insertion?**



# Maxillofacial Trauma



- Casualties with severe facial injuries can often protect their own airway by sitting up and leaning forward.



# Airway Support

Place unconscious casualties in the recovery position after the airway has been opened.

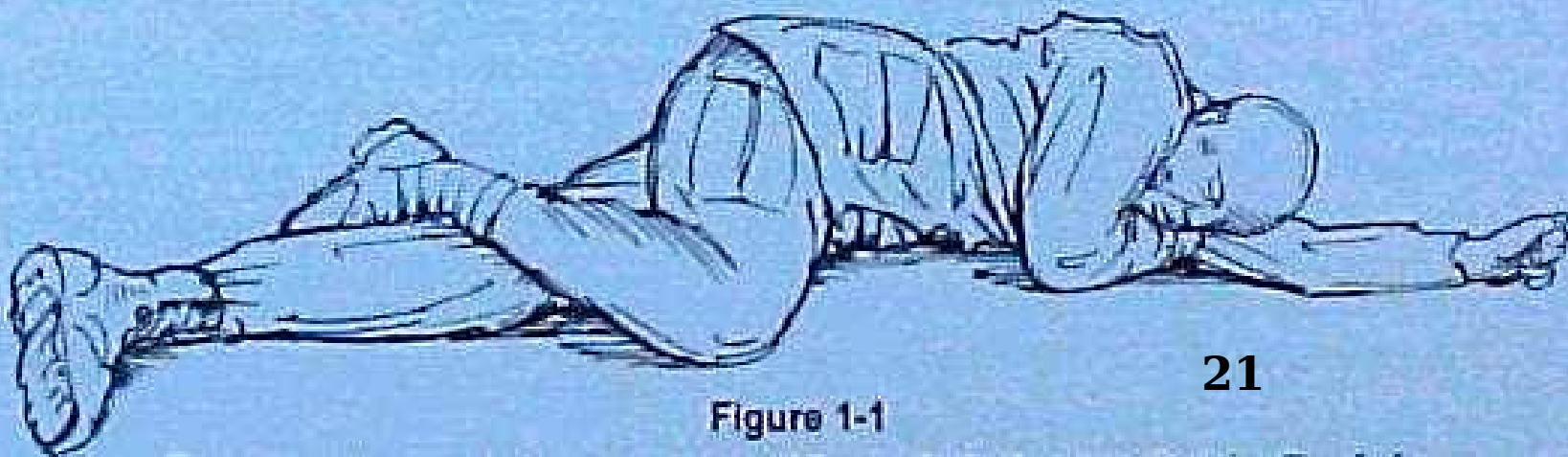


Figure 1-1

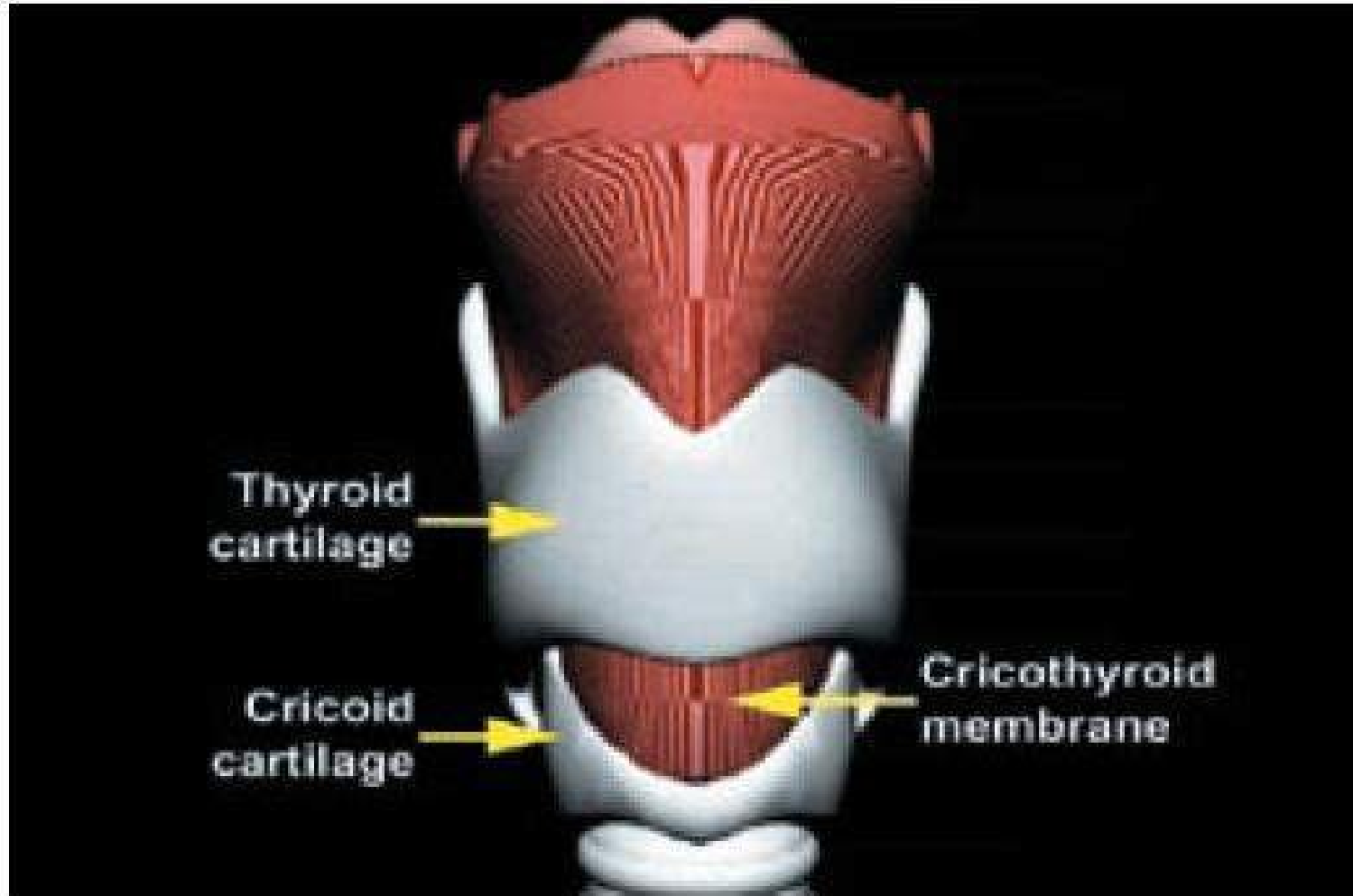


# Surgical Airway (Cricothyroidotomy)

- This series of slides and the video demonstrate a horizontal incision technique for performing a surgical airway.
- A vertical incision technique is preferred by many trauma specialists and is recommended in the Iraq/Afghanistan War Surgery textbook.
- Steps are the same except for the orientation of the incision.



# Surgical Airway (Cricothyroidotomy)







# **Surgical Incision over Cricothyroid Membrane**







# Surgical Airway

**Incise through the  
epidermis & dermis**

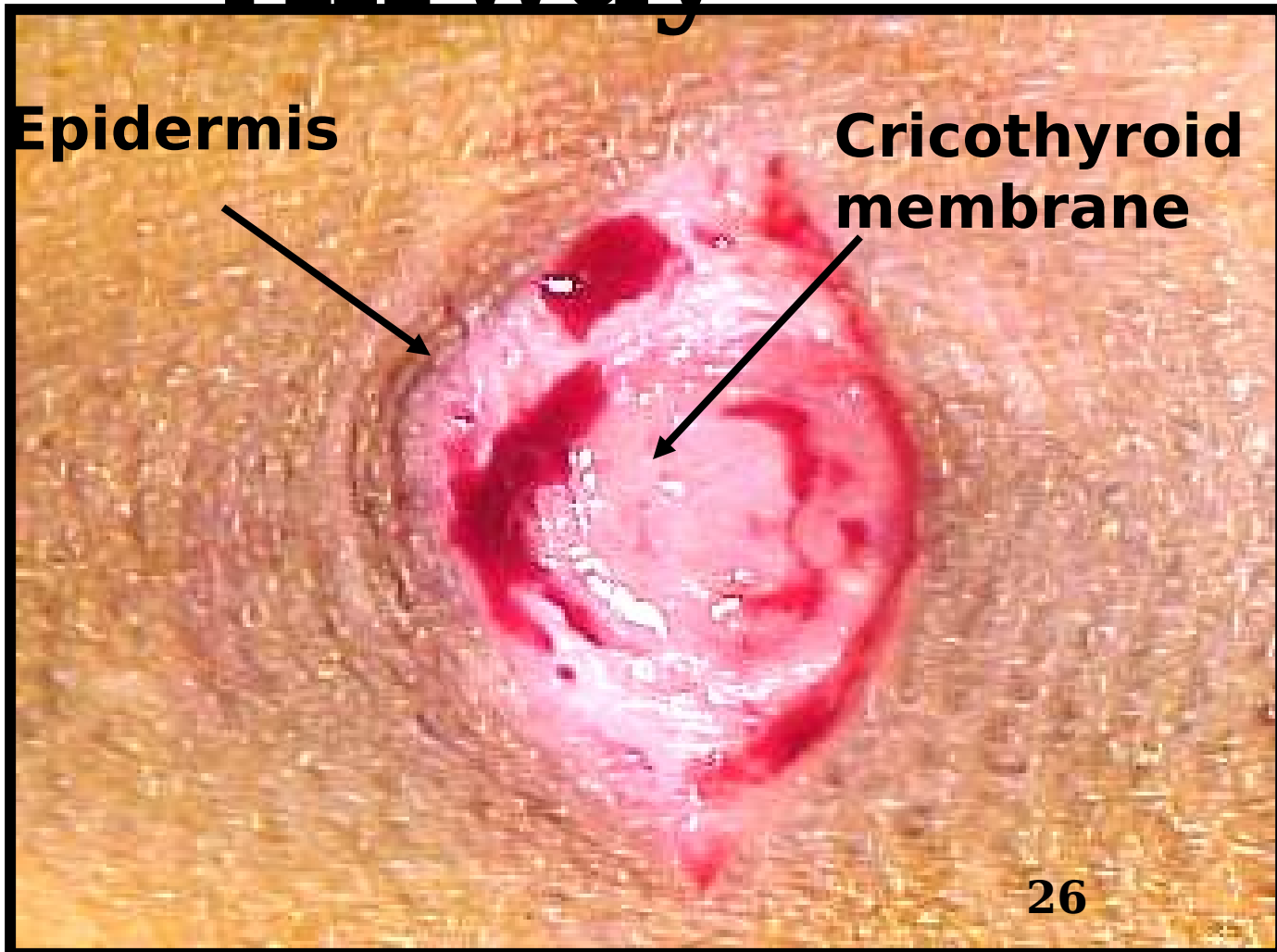
**Epidermis**

**Cricothyroid  
membrane**

**Dermis**



# Surgical Airway





# Surgical Airway



**Single stabbing  
incision through  
cricothyroid membrane**



# Surgical Airway

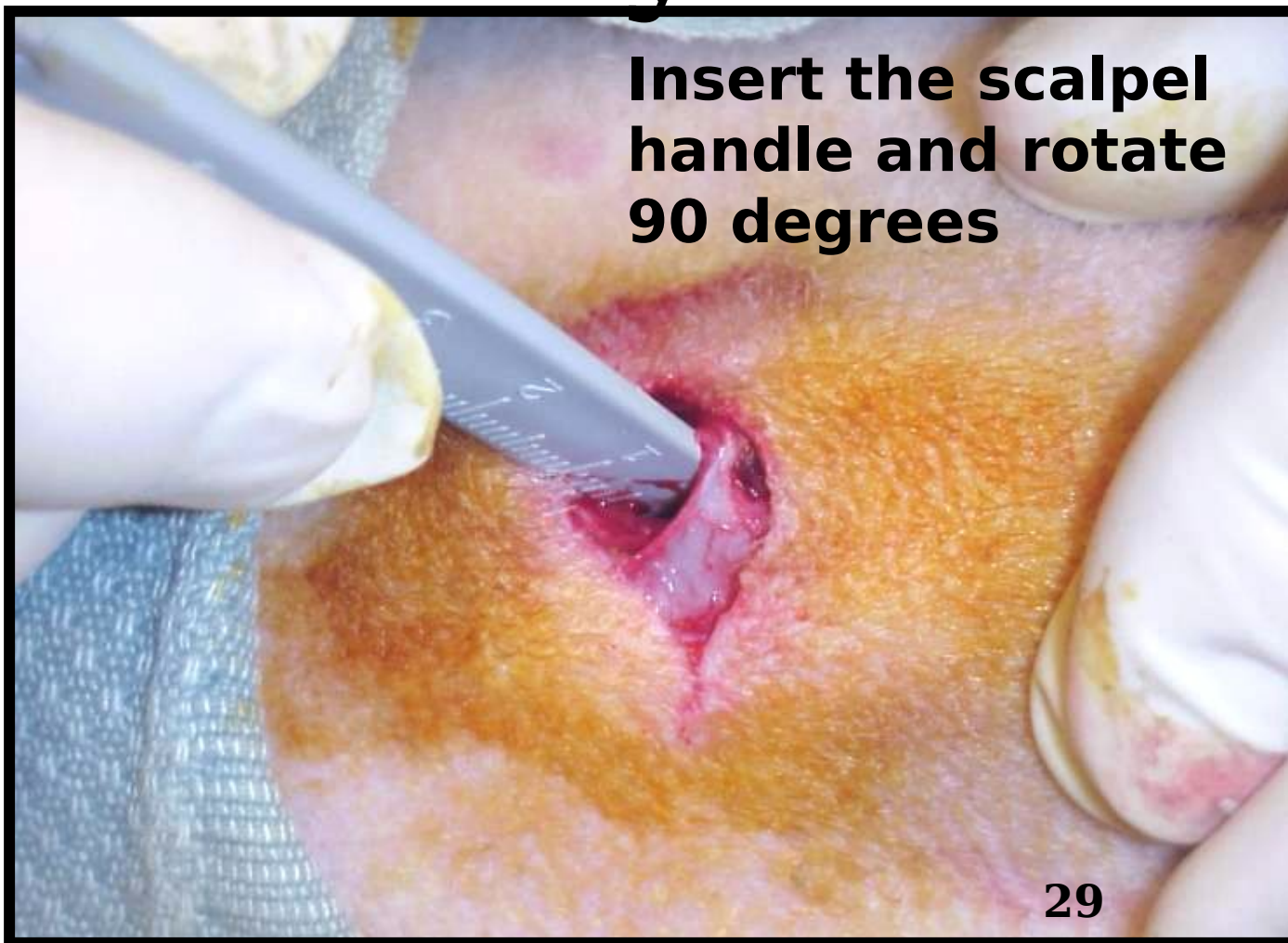
**\*\*\*You do not slice, you stab, the membrane\*\*\***







# Surgical Airway



**Insert the scalpel  
handle and rotate  
90 degrees**



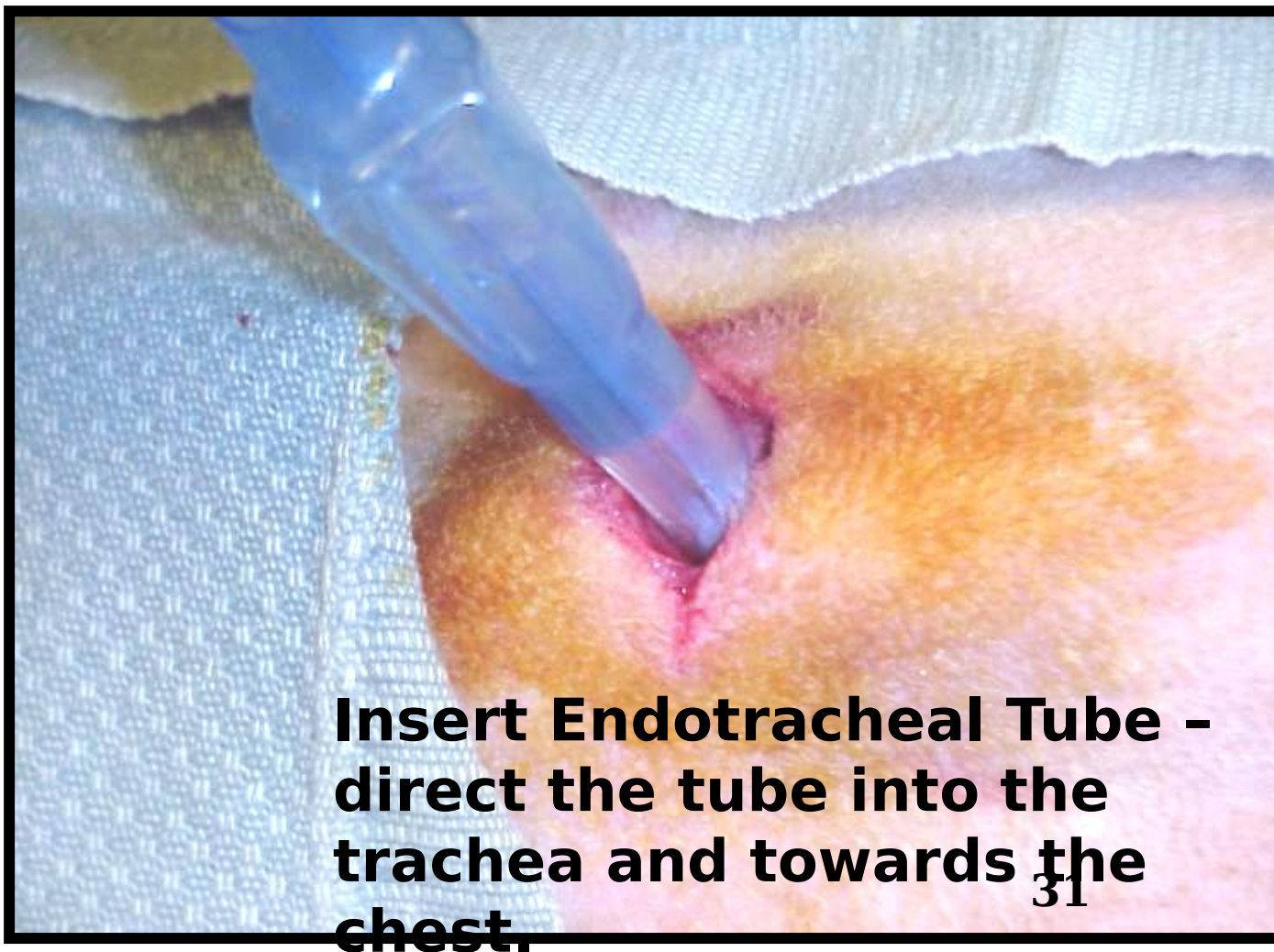
# Surgical Airway

**Insert Mosquito  
hemostat into incision  
and dilate**





# Insert ET Tube

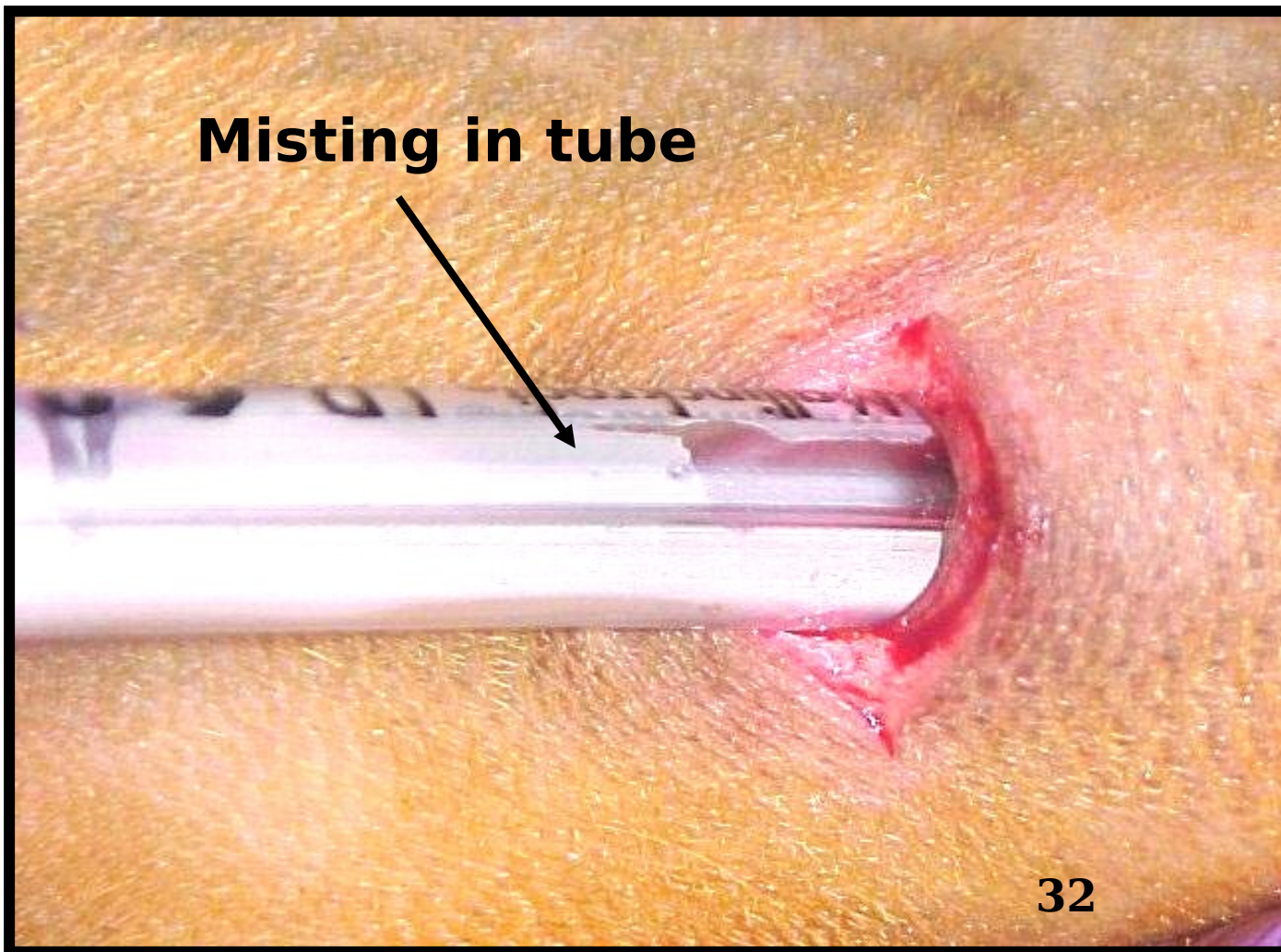


**Insert Endotracheal Tube -  
direct the tube into the  
trachea and towards the  
chest.**





# Check Placement







# Inflating the Cuff



**Note: Corpsman/medic may wish to cut ET tube off just above the inflation tube so it won't be sticking out so far**

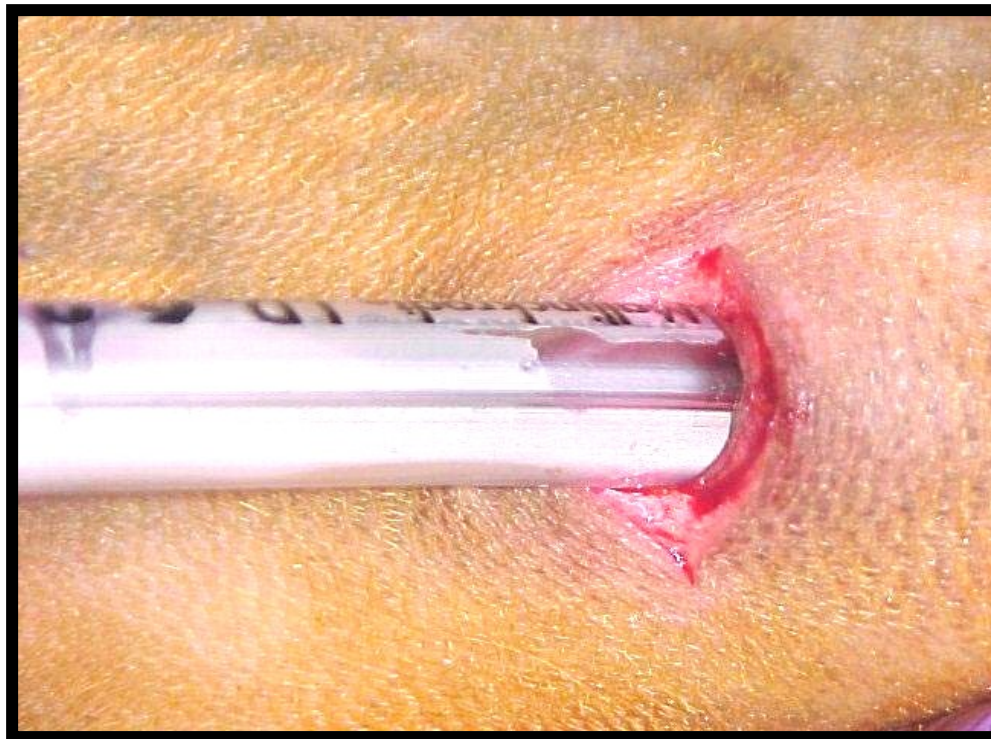


# Ventilate





# Secure the Tube



At this point, the tube should be taped securely in place with surgical tape



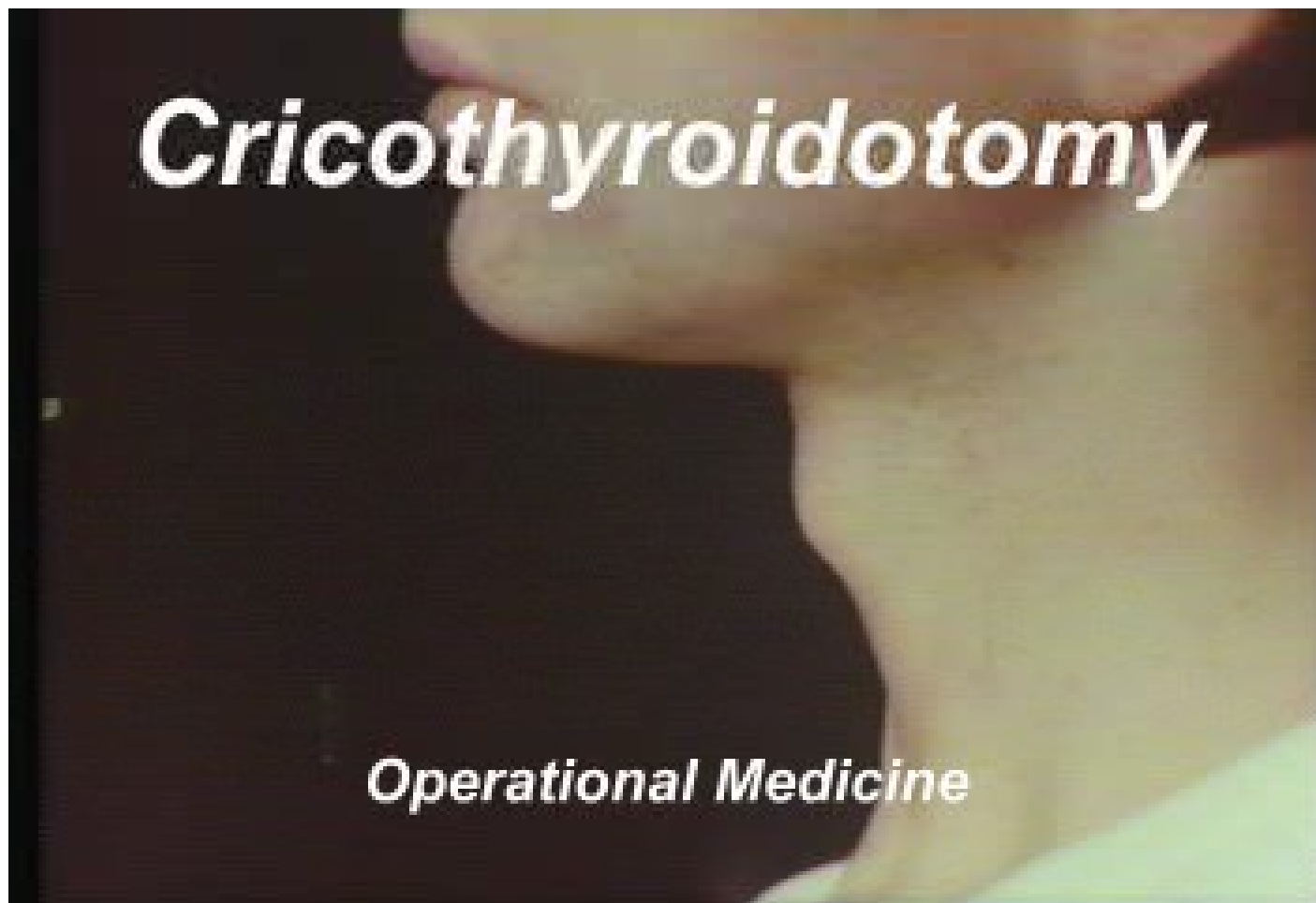
# Dress the Wound

Tape a gauze dressing over the surgical airway site.





# Surgical Airway Video







# An Actual Cricothyroidotomy



Courtesy Dr. Peter Rhee,  
Univ. of Arizona

# Airway Practical

## Nasopharyngeal Airway

## Surgical Airway





# **Tactical Field Care Guidelines**

## **3. Breathing**

**a. In a casualty with progressive respiratory distress and known or suspected torso trauma, consider a tension pneumothorax and decompress the chest on the side of the injury with a 14-gauge, 3.25 inch needle/catheter unit inserted in the second intercostal space at the midclavicular line. Ensure that the needle entry into the chest is not medial to the nipple line and is not directed towards the heart.**





# **Tactical Field Care Guidelines**

## **3. Breathing**

**b. All open and/or sucking chest wounds should be treated by immediately applying an occlusive material to cover the defect and securing it in place. Monitor the casualty for the potential development of a subsequent tension pneumothorax.**

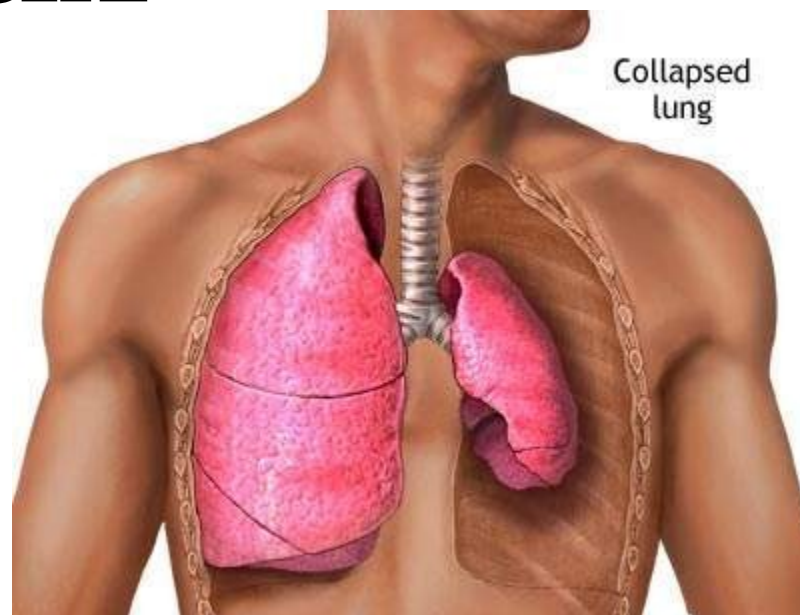


# Tension Pneumothorax

- **Tension pneumothorax is another common cause of preventable death encountered on the battlefield.**
- **Easy to treat**
- Tension pneumo may occur with entry wounds in abdomen, shoulder, or neck.
- Blunt (motor vehicle accident) or penetrating trauma (CSW) may



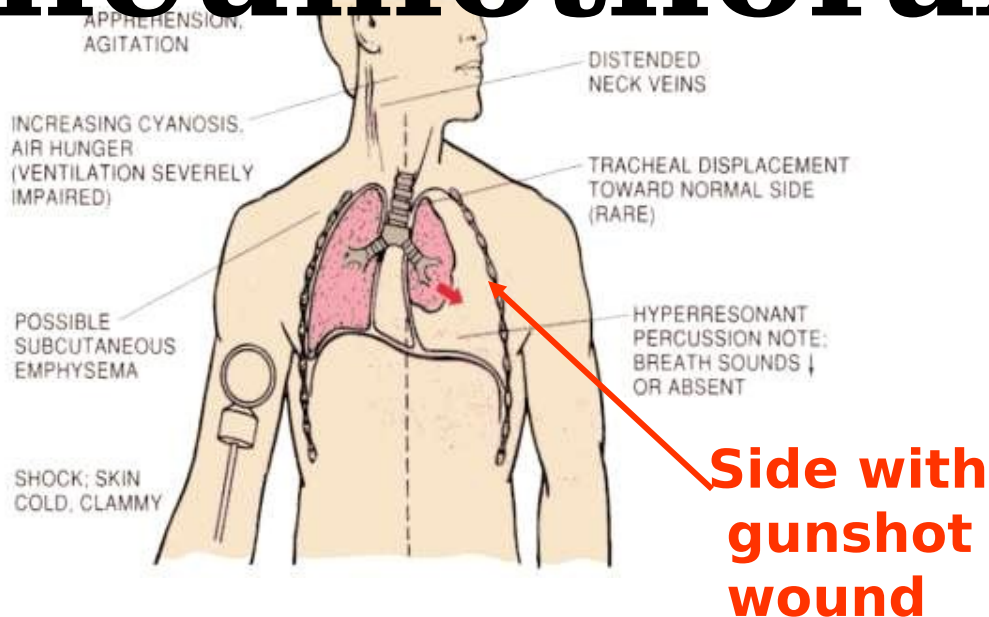
# Pneumothorax



A pneumothorax is a collection of air between the lungs and chest wall due to an injury to the chest and/or lung. The lung then collapses as shown.



# Tension Pneumothorax



A tension pneumothorax is worse. Injured lung tissue acts as a one-way valve, trapping more and more air between the lung and the chest wall.



# Tension Pneumothorax

- **Both lung function and heart function are impaired with a tension pneumothorax, causing respiratory distress and shock.**
- Treatment is to let the trapped air under pressure escape
- Done by inserting a needle into the chest



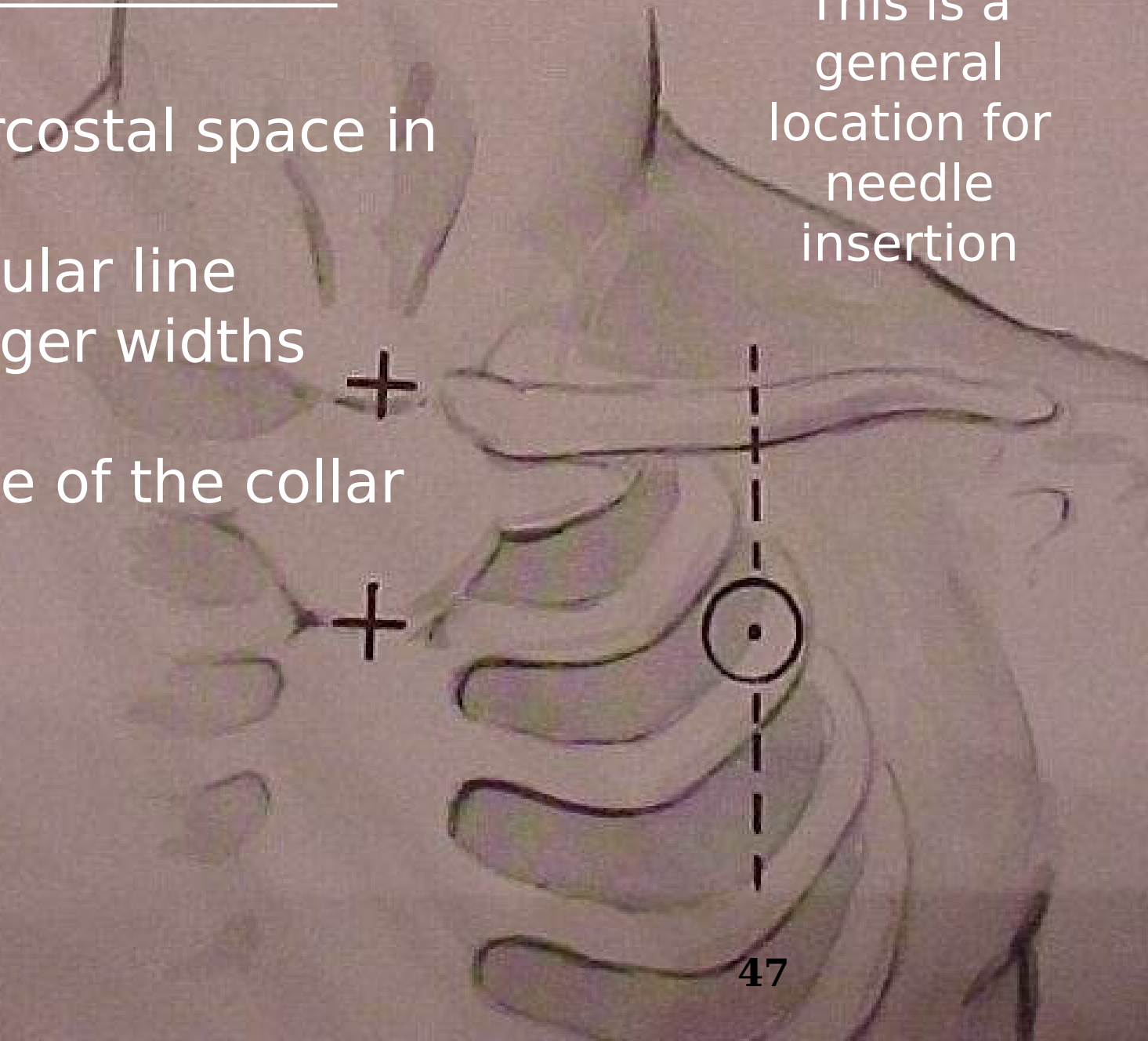
# Tension Pneumothorax

- Question: “What if the casualty does not have a tension pneumothorax when you do your needle decompression?”
- Answer:
  - If he has penetrating trauma to that side of the chest, there is already a collapsed lung and blood in the chest cavity.
  - The needle won’t make it worse if there is no tension pneumothorax.
  - If he DOES have a tension pneumothorax, you will save<sup>46</sup>his life.

# Location for Needle Entry

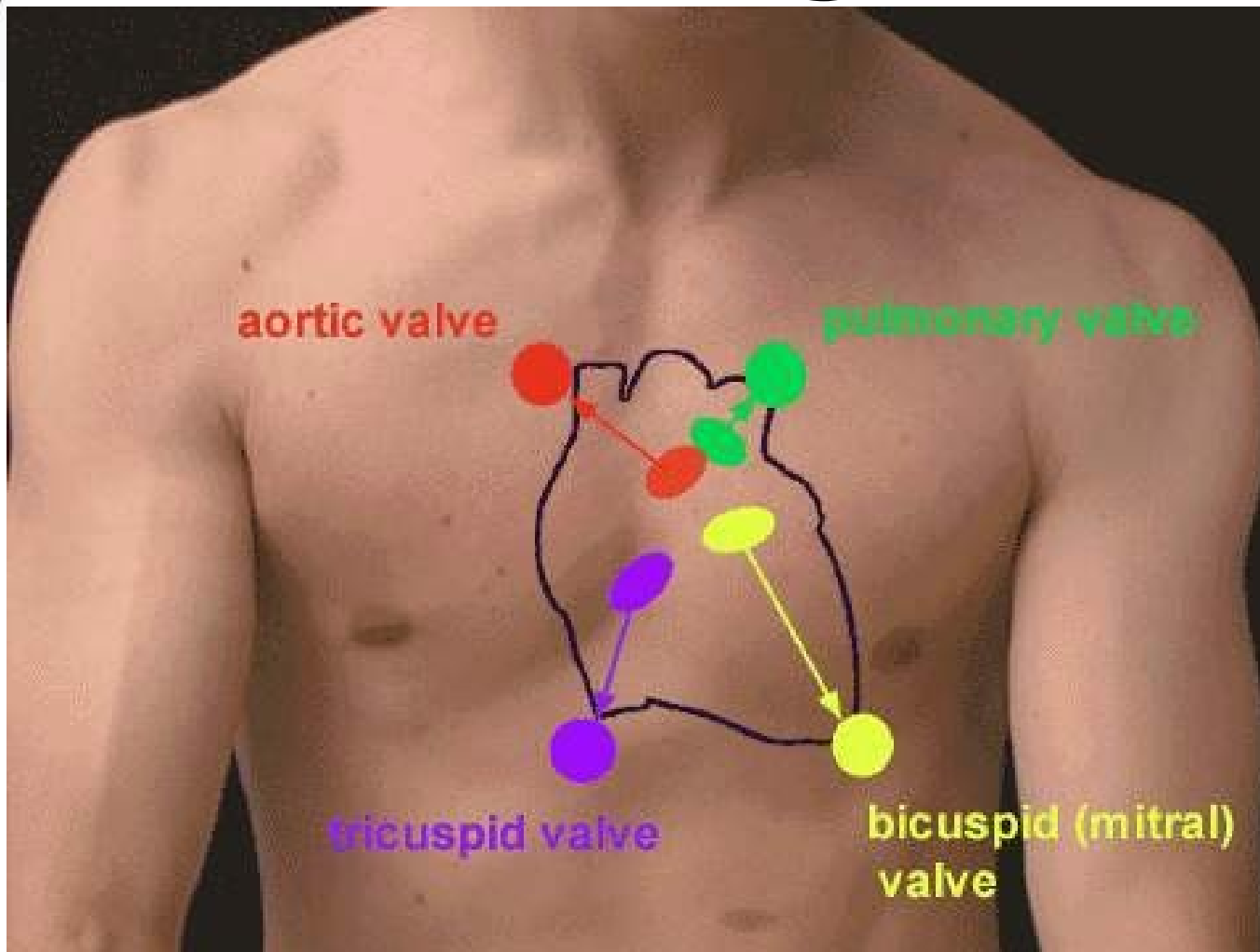
- 2nd intercostal space in the midclavicular line
- 2 to 3 finger widths below the middle of the collar bone

This is a general location for needle insertion





# Warning!



- The heart and great vessels are nearby
- Do not insert needle medial to the nipple line or point it towards the heart.

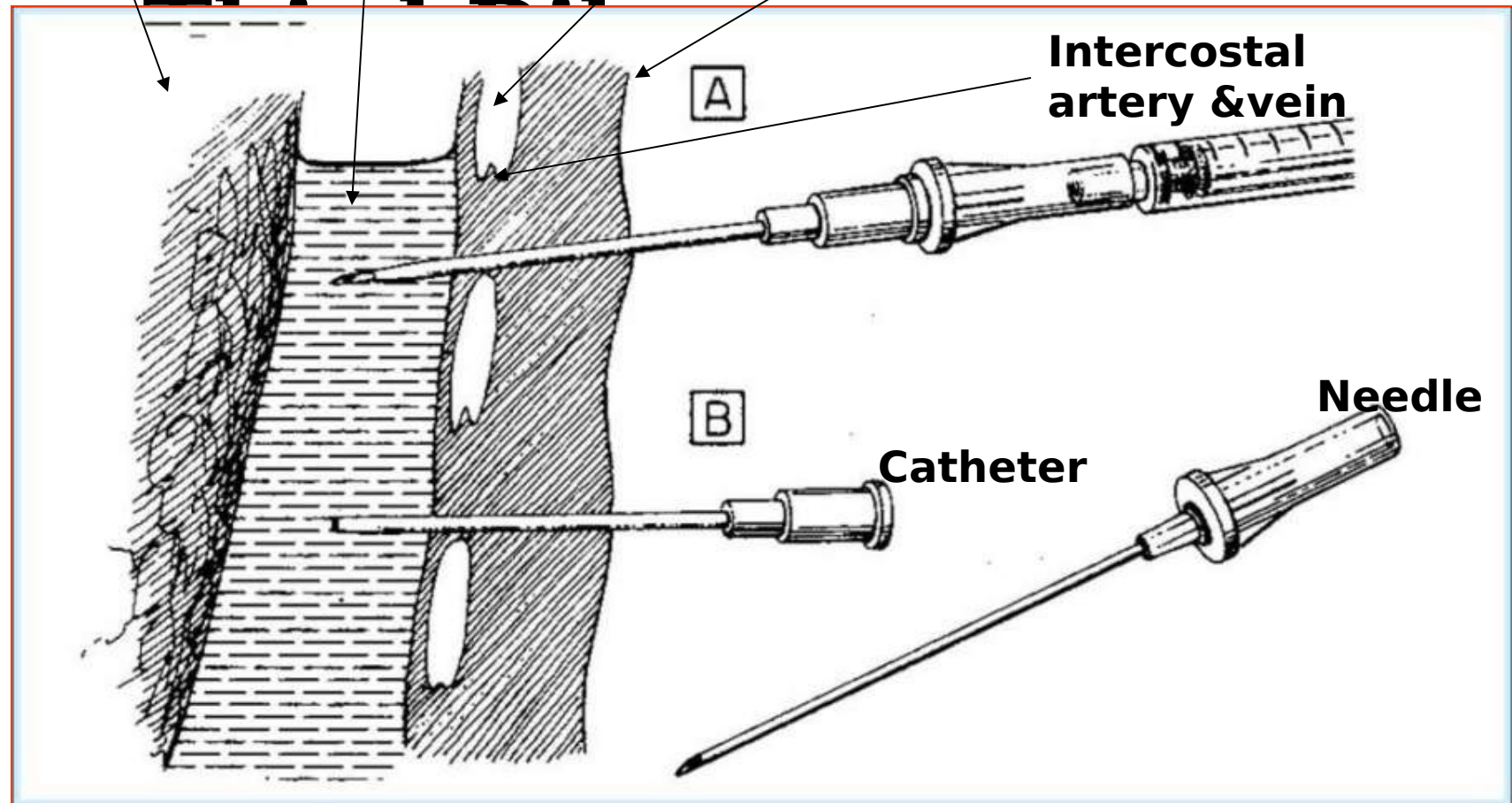




# Needle Decompression

## - Enter

Over the Top of the



This avoids the artery and vein on the bottom of the second r



# Remember!!

!

- **Tension pneumothorax is a common but easily treatable cause of preventable death on the battlefield.**

- **Diagn**



- ressively!**

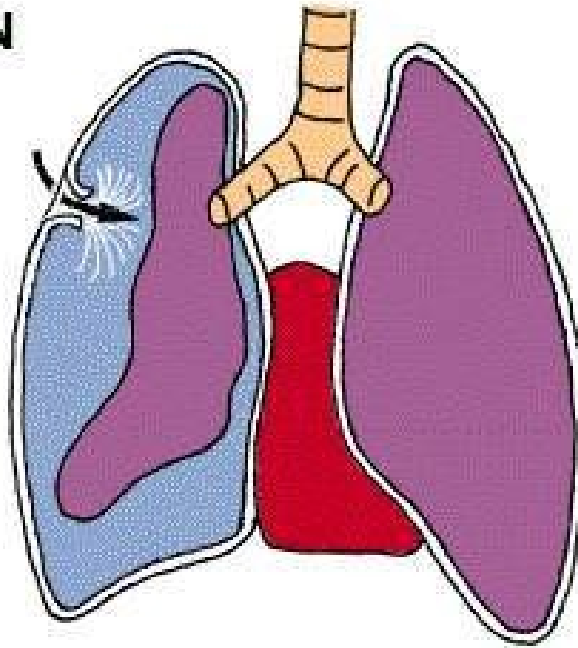


# Needle Decompression Practical



# Sucking Chest Wound (Open Pneumothorax)

OPEN



**Takes a hole in the chest the size of a nickle  
or bigger for this to occur.**



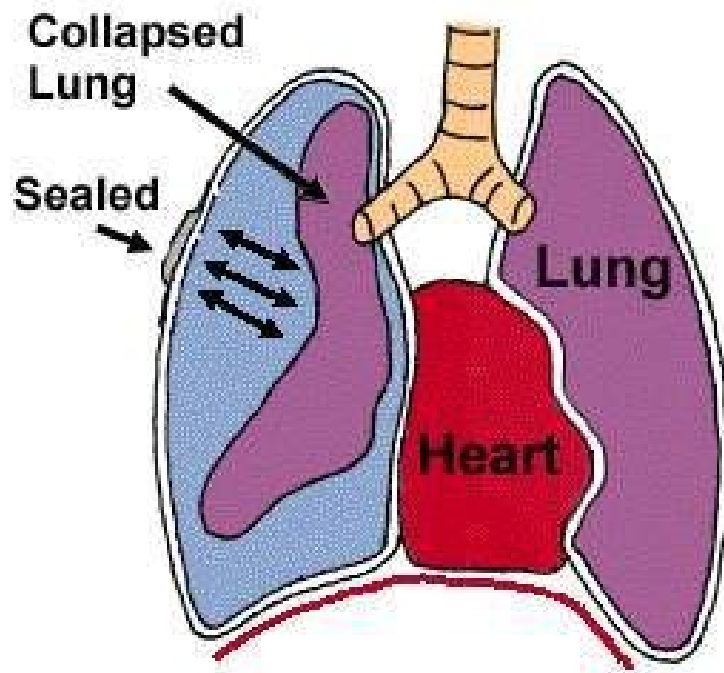
# Sucking Chest Wound

- May result from large defects in the chest wall and may interfere with ventilation
- **Treat by applying an occlusive dressing completely over the defect during expiration.**
- Monitor for possible development of subsequent tension pneumothorax.
- Allow the casualty to be in the





# Sucking Chest Wound (Treated)



**Key Point: If signs of a tension pneumothorax develop - REMOVE the occlusive dressing for a few seconds and allow the tension pneumothorax to decompress!**



# Sucking Chest Wound Video







# Sucking Chest Wound

(Treated) Video



A silhouette of a person in the foreground, holding two glowing blue light sticks high in the air. In the background, other silhouetted figures are visible, and the sky is a warm, orange-hued sunset. The overall mood is celebratory or festive.

Questions?



# **Tactical Field Care Guidelines**

## **4. Bleeding**

- a. Assess for unrecognized hemorrhage and control all sources of bleeding. If not already done, use a CoTCCC-recommended tourniquet to control life-threatening external hemorrhage that is anatomically amenable to tourniquet application or for any traumatic amputation. Apply directly to the skin 2-3 inches above wound.**



# Tactical Field Care Guidelines

## 4. Bleeding

Compressible hemorrhage not amenable to tourniquet is an adjunct to tourniquet removal (if evacuation time is anticipated to be longer than two hours), use **Combat Gauze**, **hemostatic agent of choice**. Combat Gauze should be used with **at least 3 minutes of direct pressure**. Before applying any tourniquet on a casualty who has been resuscitated for hemorrhagic shock, ensure a positive response to resuscitation, i.e., a peripheral pulse normal in character and normal in rate, if there is no traumatic brain injury (TBI).



# Tactical Field Care Guidelines

## 4. Bleeding

- c. **Reassess prior tourniquet application.** Expose wound and determine if tourniquet is needed. If so, replace tourniquet over uniform with another applied directly to skin 2-3 inches above wound. If tourniquet is not needed, use other techniques to control bleeding.



# **Tactical Field Care Guidelines**

## **4. Bleeding**

**d. When time and the tactical situation permit, a distal pulse check should be accomplished. If a distal pulse is still present, consider additional tightening of the tourniquet or the use of a second tourniquet, side by side and proximal to the first, to eliminate the distal pulse.**





# **Tactical Field Care Guidelines**

## **4. Bleeding**

**e. Expose and clearly mark all tourniquet sites with the time of tourniquet application. Use an indelible marker.**



# Tourniquets

## Points to Remember

- Damage to the arm or leg is rare if the tourniquet is left on less than two hours.
- Tourniquets are often left in place for several hours during surgical procedures.
- In the face of massive extremity hemorrhage, it is better to accept the small risk of damage to the limb than to have a casualty bleed



# Tourniquets: Points to Remember

- All unit members should have a CoTCCC-approved tourniquet at a standard location on their battle gear.
- Should be easily accessible if wounded
  - **DO NOT** bury it at the bottom of your pack
- When a tourniquet has been applied,  
**DO NOT** periodically loosen it to allow circulation to return to the limb.
  - Causes unacceptable additional blood loss



# Tourniquets

## Points to Remember

Tightening the tourniquet enough to eliminate the distal pulse will help to ensure that all bleeding is stopped and that there will be no damage to the extremity from blood entering the limb. If the tourniquet is not being





# Removing the Tourniquet

**Do not remove the tourniquet if:**

- The extremity distal to the tourniquet has been traumatically amputated
- The casualty is in shock
- The tourniquet has been on for more than 6 hours
- The casualty will arrive at a medical treatment facility within 2 hours after time of application
- Tactical or medical considerations make transition to other hemorrhage control methods inadvisable



# Removing the Tourniquet

- Consider removing the tourniquet once bleeding can be controlled by other methods
- Only a combat medic/corpsman/PJ, a PA, or a nurse should loosen tourniquets







# Removing the Tourniquet

- Loosen the tourniquet slowly.
  - Observe for bleeding
- Apply Combat Gauze to the wound per instructions later in the presentation if wound is still bleeding.
- If bleeding remains controlled, cover the Combat Gauze with a pressure dressing.
  - Leave loose tourniquet in place.
- If bleeding is not controlled without the tourniquet, re-tighten it.



# TCCC

## Hemostatic Agent



**Combat Gauze** 69



# Combat Gauze

- Combat Gauze has been shown in lab studies to be more effective than the previous hemostatic HemCon and QuikClot
- Both Army (USAISR) and Navy (NMRC) studies confirmed



	<b>QC ACS</b>	<b>HemCon</b>	<b>Celox</b>	<b>WoundStat</b>	<b>Combat Gauze</b>
Hemostatic efficacy	+	+	+++	++++	++++
Side effect	None	None	---	---	None
Ready to use	√	√	√	√	√
Training requirement	+	+	+	+++	++
Lightweight and durable	++	+++	+++	++	+++
2 yrs Shelf life	√	√	√	√	√
Stable in extreme condition	√	√	√	√	√
FDA approved	√	√	√	√	√
Biodegradable	No	No	Yes	No	No
Cost (\$)	~30	~75	~ 25	30- 35	~25



# **CoTCCC**

## **Recommendation**

### **February 2009**

- **Combat Gauze is the hemostatic agent of choice**
- **The previously recommended agent WoundStat has been removed from the guidelines as a result of concerns about its safety**
- **Additionally, combat medical personnel preferred a gauze-type**



# Combat Gauze

- Combat Gauze<sup>TM</sup> demonstrated an increased ability to stop bleeding over other hemostatic agents.
- No exothermic (heat generating) reaction when applied.
- Cost is significantly less than the previously recommended HemCon.<sup>TM</sup>





# Combat Gauze<sup>TM</sup>

## NSN 6510-01-562-3325

- Combat Gauze<sup>TM</sup> is a 3-inch x 4-yard roll of sterile gauze.
- The gauze is impregnated with kaolin, a material that causes the blood to clot
- Has been found in lab studies





# Combat Gauze Directions (1)

## Expose Wound & Identify Bleeding

- Open clothing around the wound
- If possible, remove excess pooled blood from the wound while preserving any clots already formed in the wound.
- Locate source of most active bleeding.

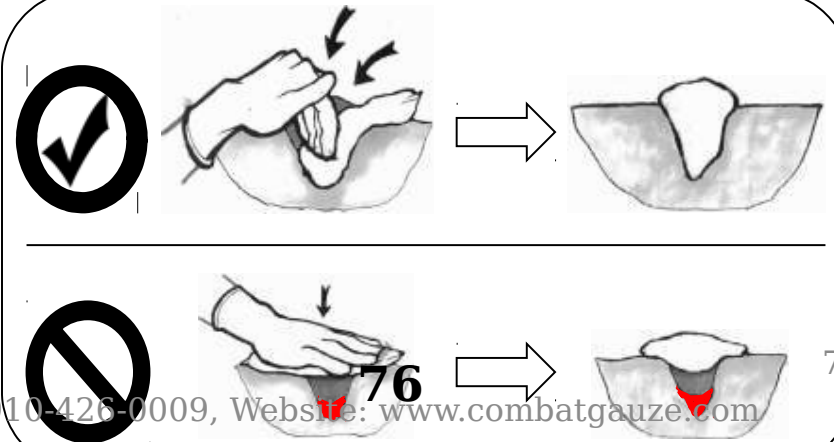




# Combat Gauze Directions (2)

## Pack Wound Completely

- Pack Combat Gauze™ tightly into wound and directly onto bleeding source.
- More than one gauze may be required to stem blood flow.
- Combat Gauze™ may be re-packed or adjusted in the wound to ensure proper placement





# Combat Gauze Directions (3)

## Apply Direct Pressure

- Quickly apply pressure until bleeding stops.
- Hold continuous pressure for 3 minutes.
- Reassess to ensure bleeding is controlled.
- Combat Gauze may be repacked or a second gauze used if initial application fails







# Combat Gauze Directions (4)

## Bandage over Combat Gauze

- Leave Combat Gauze™ in place.
- Wrap to effectively secure the dressing in the wound.



Although the Emergency Trauma Bandage is shown in this picture, the wound may be secured with any compression bandage, Ace™ wrap, roller gauze, or cravat.



# Combat Gauze Directions (5)

## Transport & Monitor Casualty

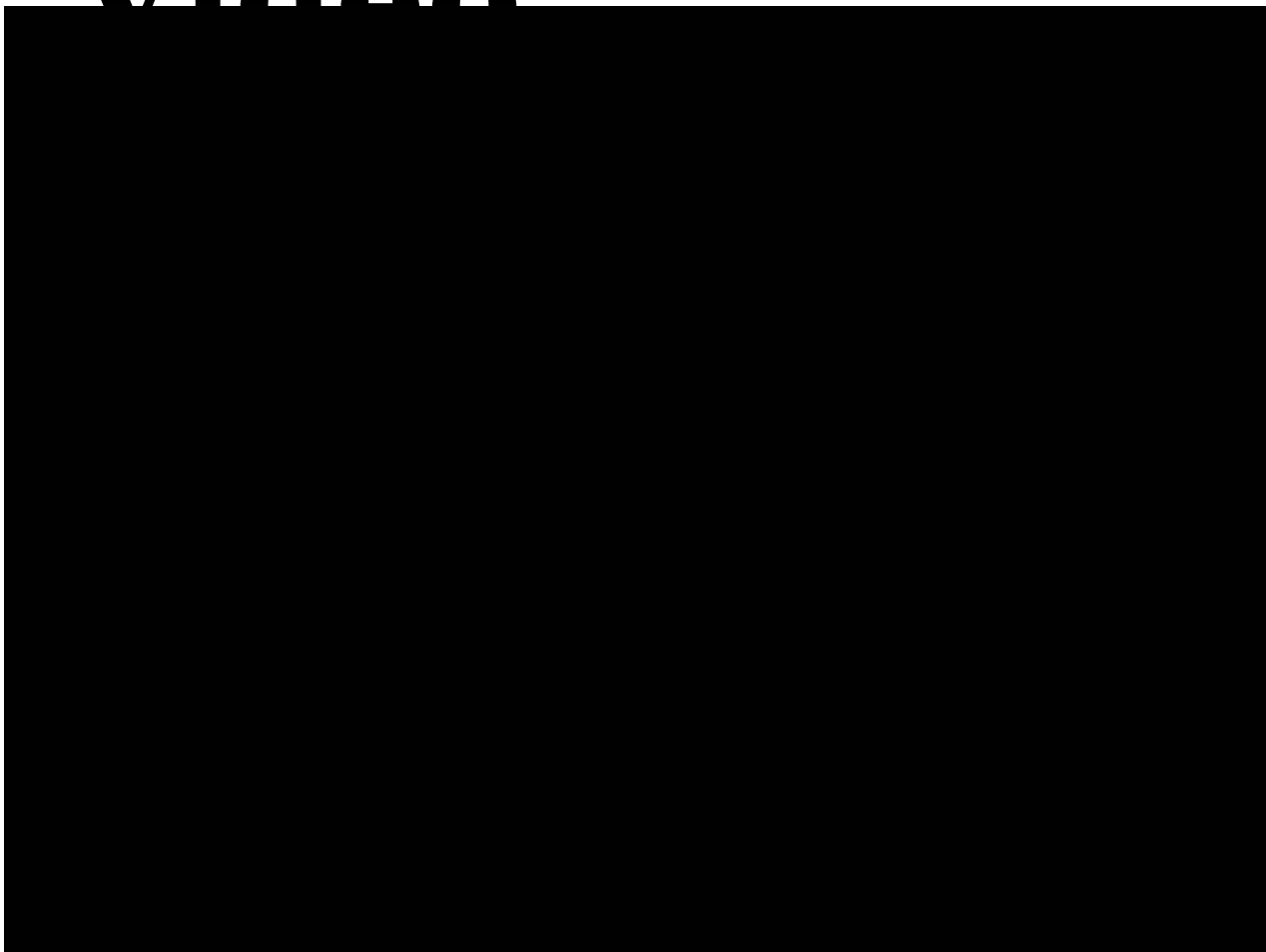
- Do not remove the bandage or Combat Gauze.™
- Transport casualty to next level of medical care as soon as possible.







# Combat Gauze Video





# Direct Pressure

- Can be used as a temporary measure.
- It works most of the time for external bleeding.
- It can stop even carotid and femoral bleeding.
- Bleeding control requires very firm pressure.
- **Don't let up pressure to check the wound until you are prepared to control bleeding with a hemostatic agent or a tourniquet!**
- **Use for 3 full minutes after applying Combat Gauze.**



Question  
s?



# Combat Gauze Practical





# **Tactical Field Care Guidelines**

## **5. Intravenous (IV) access**

- Start an 18-gauge IV or saline lock if indicated.**
- If resuscitation is required and IV access is not obtainable, use the intraosseous (IO) route.**



# IV Access - Key Point

- **NOT ALL CASUALTIES NEED IVs!**
  - IV fluids not required for minor wounds
  - IV fluids and supplies are limited – save them for the casualties who really need them
  - IVs take time
  - Distract from other care required
  - May disrupt tactical flow – waiting 10 minutes to start an IV on a casualty





# IV Access

## Indications for IV access

- Fluid resuscitation for hemorrhagic shock or
  - Significant risk of shock – GSW to torso
- Casualty needs medications, but cannot take them PO:
  - Unable to swallow
  - Vomiting
  - Shock



# IV Access

A single 18ga catheter is recommended for access:

- Easier to start than larger catheters
- Minimizes supplies that must be carried
- All fluids carried on the battlefield can be given rapidly through an 18 gauge catheter.
- Two larger gauge IVs will be<sup>87</sup>



# IV Access - Key Points

- Don't insert an IV distal to a significant wound!
- A saline lock is recommended instead of an IV line unless fluids are needed immediately.
  - Much easier to move casualty without the IV line and bag attached
  - Less chance of traumatic disinsertion of IV
  - Provides rapid subsequent access if needed



# **Rugged Field IV Setup (1)**

## **Start a Saline Lock and Cover with Tegaderm**





# **Rugged Field IV Setup (2)**

## **Flush Saline Lock with 5 cc**

## **of IV Fluid**



lock must be flushed immediately (within 2-3 minutes)  
then flushed every 2 hours if IV fluid is not running.



# **Rugged Field IV Setup (3)**

## **Insert Second Needle/Catheter**







# **Rugged Field IV Setup (4) Secure IV Line with**





# **Rugged Field IV Setup (5)**

## **Remove IV as Needed for Transport**





# Questions?



# Intraosseous (IO) Access

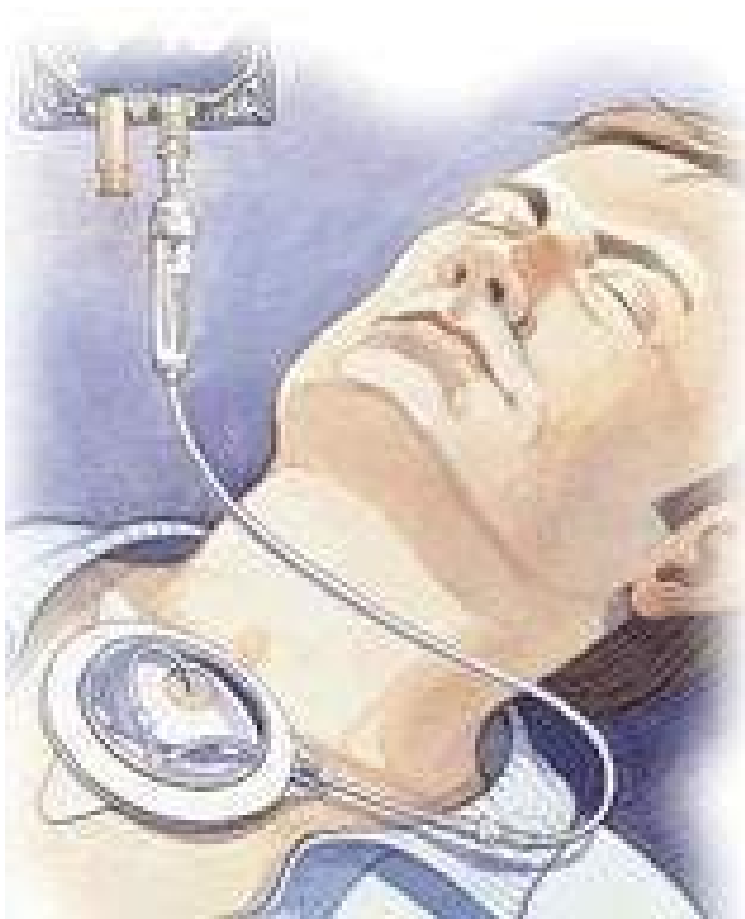


**If unable to start an IV and fluids or  
meds are needed 95**

**urgently insert a sternal I/O line to**



# Pyng FAST IO Device





# Pyng FAST Warnings

## **PYNG FAST NOT RECOMMENDED IF:**

- Patient is of small stature:
  - Weight of less than 50 kg (110 pounds)
- Fractured manubrium/sternum – flail chest
- Significant tissue damage at site
- Severe osteoporosis
- Previous sternotomy and/or scar

- **NOTE: PYNG FAST SHOULD NOT BE LEFT IN PLACE FOR MORE THAN 24 HOURS**





# Pyng FAST IO Flow Rates

- 30 ml/min by gravity
- 125 ml/min utilizing pressure infusion
- 250 ml/min using syringe forced infusion



# Pyng FAST Insertion (1)



1. Prepare site using aseptic technique:
  - Betadine
  - Alcohol



# Pyng FAST Insertion (2)



2. Finger at suprasternal notch
3. Align finger with patch indentation
4. Place patch



# Pyng FAST Insertion (3)



5. Place  
introducer  
needle  
cluster in  
target area
6. Assure firm  
grip
7. **Introducer  
device must  
be<sup>101</sup>  
perpendicular**



# Pyng FAST Insertion (4)



8. Align introducer perpendicular to the sternum.
9. Insert using increasing pressure till device releases.  
(~60 pounds)
10. Maintain 90 degree



# Pyng FAST Insertion (5)



11. Following device release, infusion tube separates from introducer
12. Remove introducer by pulling straight back
13. Cap introducer





# Pyng FAST Insertion (6)



14. Connect infusion tube to tube on the target patch
15. NOTE: Must flush bone plug with 5 cc of fluid to get flow.
16. Assure patency by using



# Pyng FAST Insertion (7)



17. Connect IV line to target patch tube

18. Open IV and assure good flow



# Pyng FAST Insertion (8)



19. Place dome to protect infusion site



Be certain  
that  
removal  
device is  
attached  
to casualty.





# Pyng FAST Insertion (10)

Based on combat medical input, the F.A.S.T. 1 company has modified the packaging so that the removal device is attached to the protective dome. This will ensure that the removal device will always travel with the patient.



# Pyng FAST Insertion (11)

## Potential Problems:

- Infiltration
  - Usually due to insertion not perpendicular to sternum
- Inadequate flow or no flow
  - Infusion tube occluded with bone plug
  - Use additional saline flush to clear the bone plug





# Pyng FAST IO Access -

## Key Points

- **DO NOT insert the Pyng FAST on volunteers as part of training - use the training device provided.**
- **Should not have to remove in the field - it can be removed at the medical treatment facility. Slides describing the removal process are in the back-up slides for this presentation.**
- **BE SURE to keep the removal device with the casualty so that that**



# Pyng FAST Insertion Video



## Key Points Not Shown in Video

Remember to flush the bone plug - may cause pain  
Remember to run IV fluids through the IV  
line before connecting.



Questions?  
IV/IO Practical



# **Tactical Field Care Guidelines**

## **6. Fluid Resuscitation**

- **Assess for hemorrhagic shock; altered mental status (in the absence of head injury) and weak or absent peripheral pulses are the best field indicators of shock.**

### **a. If not in shock:**

- **No IV fluids necessary**
- **PO fluids permissible if conscious and can**

**swallow**



# **Tactical Field Care Guidelines**

## **6. Fluid Resuscitation**

### **b. If in shock:**

- Hextend, 500ml IV bolus**
- Repeat once after 30 minutes if still in shock**
- No more than 1000ml of Hextend**



# **Tactical Field Care Guidelines**

## **6. Fluid Resuscitation**

**c. Continued efforts to resuscitate must be weighed against logistical and tactical considerations and the risk of incurring further casualties.**





# Tactical Field Care Guidelines

## 6. Fluid Resuscitation

- d. If a casualty with an altered mental status due to suspected TBI has a weak or absent peripheral pulse, resuscitate as necessary to maintain a palpable radial pulse.**



# Blood Loss and Shock

## What is “Shock?”

- Inadequate blood flow to the body tissues
- Leads to inadequate oxygen delivery and cellular dysfunction
- May cause death
- Shock can have many causes, but on the battlefield, it is typically caused by severe<sup>TT7</sup>



# **Blood Loss and Shock**

**Question: How does your  
body react to blood loss?**

**Answer: It depends - on how  
much blood you lose.**



# Normal Adult Blood Volume

5 Liters

Volume





# **500cc Blood Loss**

## **4.5 Liters Blood Volume**





# 500cc Blood Loss

- Mental State: Alert
- Radial Pulse: Full
- Heart Rate: Normal or slightly increased
- Systolic Blood pressure: Normal
- Respiratory Rate: Normal
- Is the casualty going to die from this?



# **1000cc Blood Loss**

## **4.0 Liters Blood Volume**







# 1000cc Blood Loss

- Mental State: Alert
- Radial Pulse: Full
- Heart Rate: 100 +
- Systolic Blood pressure: Normal lying down
- Respiratory Rate: May be normal
- Is the casualty going to die from this?

No



# **1500cc Blood Loss**

**3.5 Liters Blood Volume**





# 1500cc Blood Loss

- Mental State: Alert but anxious
- Radial Pulse: May be weak
- Heart Rate: 100+
- Systolic Blood pressure: May be decreased
- Respiratory Rate: 30
- Is the casualty going to die from this?



# **2000cc Blood Loss**

**3.0 Liters Blood Volume**





# 2000cc Blood Loss

- Mental State: Confused/lethargic
- Radial Pulse: Weak
- Heart Rate: 120 +
- Systolic Blood pressure: Decreased
- Respiratory Rate: >35
- Is the casualty going to die from this?



# **2500cc Blood Loss**

**2.5 Liters Blood Volume**





# 2500cc Blood Loss

- Mental State: Unconscious
- Radial Pulse: Absent
- Heart Rate: 140+
- Systolic Blood pressure:  
Markedly decreased
- Respiratory Rate: Over 35
- Is he going to die from this?

Probably <sub>129</sub>



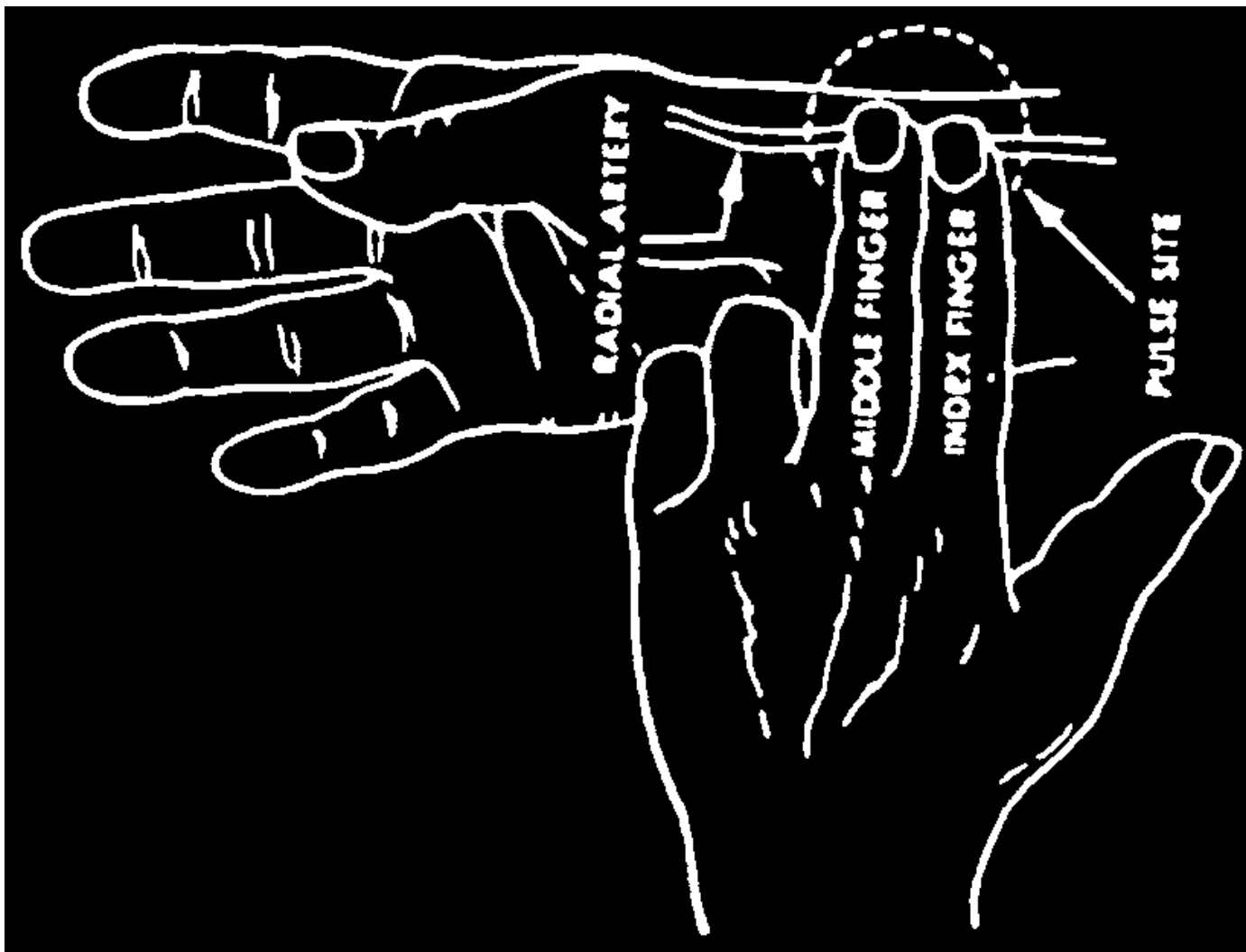


# Recognition of Shock on the Battlefield

- Combat medical personnel need a fast, reliable, low-tech way to recognize shock on the battlefield.
- **The best TACTICAL indicators of shock are:**
  - **Decreased state of consciousness** (if casualty has not suffered TBI)
  - and/or**
  - **Abnormal character of the radial pulse** (weak or absent)



# Palpating for the Radial Pulse





# Fluid Resuscitation Strategy

If the casualty is not in shock:

- **No IV fluids necessary - SAVE IV FLUIDS FOR CASUALTIES WHO REALLY NEED THEM.**
- PO fluids permissible if casualty can swallow
  - Helps treat or prevent dehydration
  - OK, even if wounded in abdomen
    - Aspiration is extremely low risk in light of benefits
    - Dehydration increases





# Hypotensive Resuscitation

## Goals of Fluid Resuscitation Therapy

- Improved state of consciousness (if no TBI)
- Palpable radial pulse corresponds roughly to systolic blood pressure of 80 mm Hg
- Avoid over-resuscitation of shock from torso wounds.
- **Too much fluid volume may make internal hemorrhage worse by**



# Choice of Resuscitation Fluid in the Tactical Environment

- Why use Hextend instead of the much less expensive Ringer's Lactate used in civilian trauma?
- 1000ml of Ringers Lactate (2.4 pounds) will yield an expansion of the circulating blood volume of only about 200ml one hour after the fluid is given.
- **The other 800ml of RL has left the circulation after an hour and entered other fluid spaces in the body - FLUID THAT HAS LEFT THE CIRCULATION DOES NOT HELP TREAT SHOCK AND MAY CAUSE OTHER PROBLEMS**



# Choice of Resuscitation Fluid

- 500ml of 6% hetastarch (trade name Hextend®, weighs 1.3lbs) and will yield an expansion of the intravascular volume of 600-800ml.
- **This intravascular expansion is still present 8 hours later - may be critical if evacuation is delayed.**
- Hextend®
  - Less weight to carry for equal effect
  - Stays where it is supposed to be longer and does the casualty more good
  - Less likely to cause undesirable side



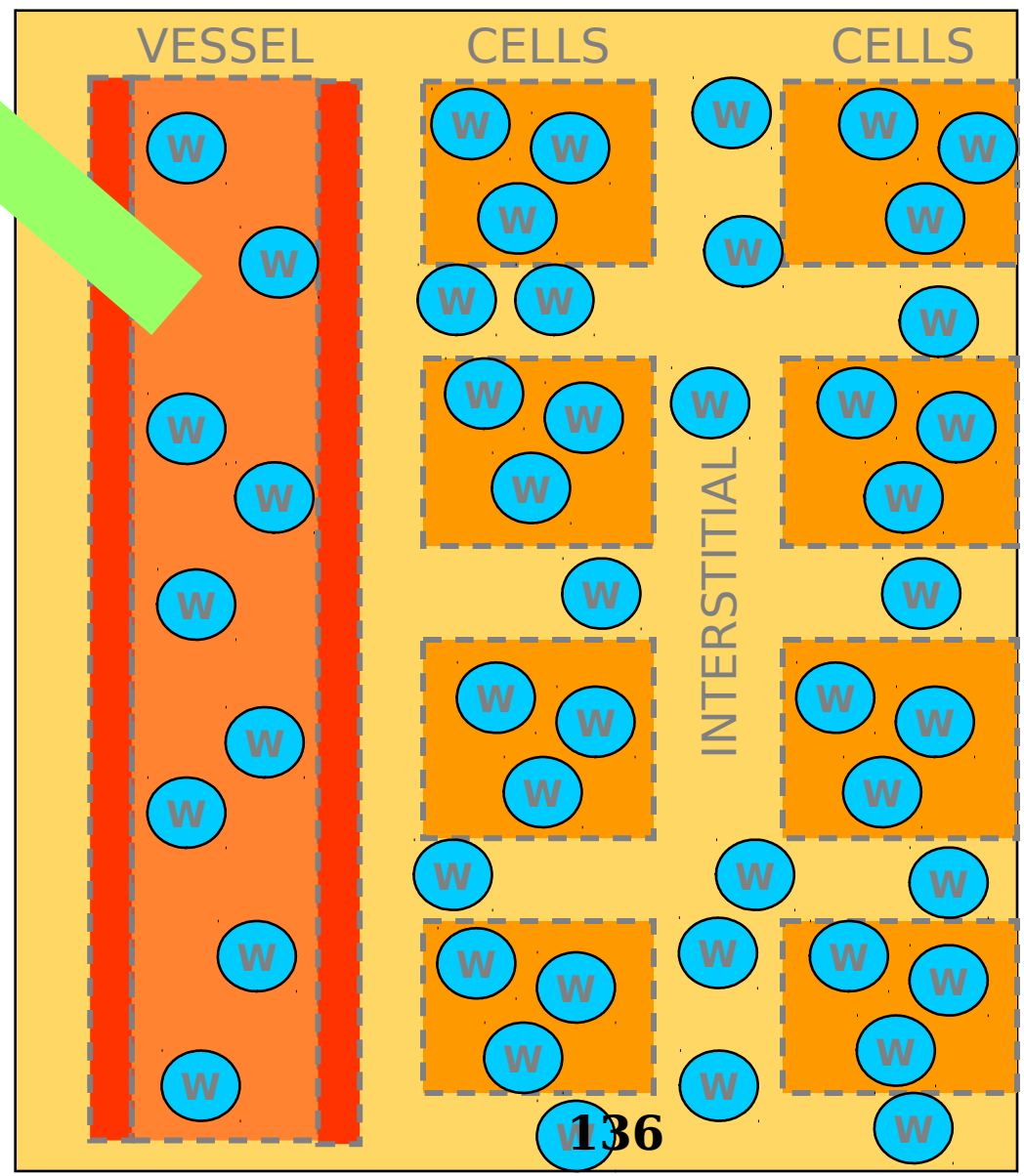
# Crystallloid Fluid

## Shifts

Water Molecules

LR Molecules

- Small sodium, chloride, potassium, etc. from crystalloids leak through vessel membranes
- In 1 hour, only 25% of crystalloid fluid is still in the vascular space
- For a 1000ml bag, that's only 250ml still in the vessels
- The rest of the fluid diffuses to the



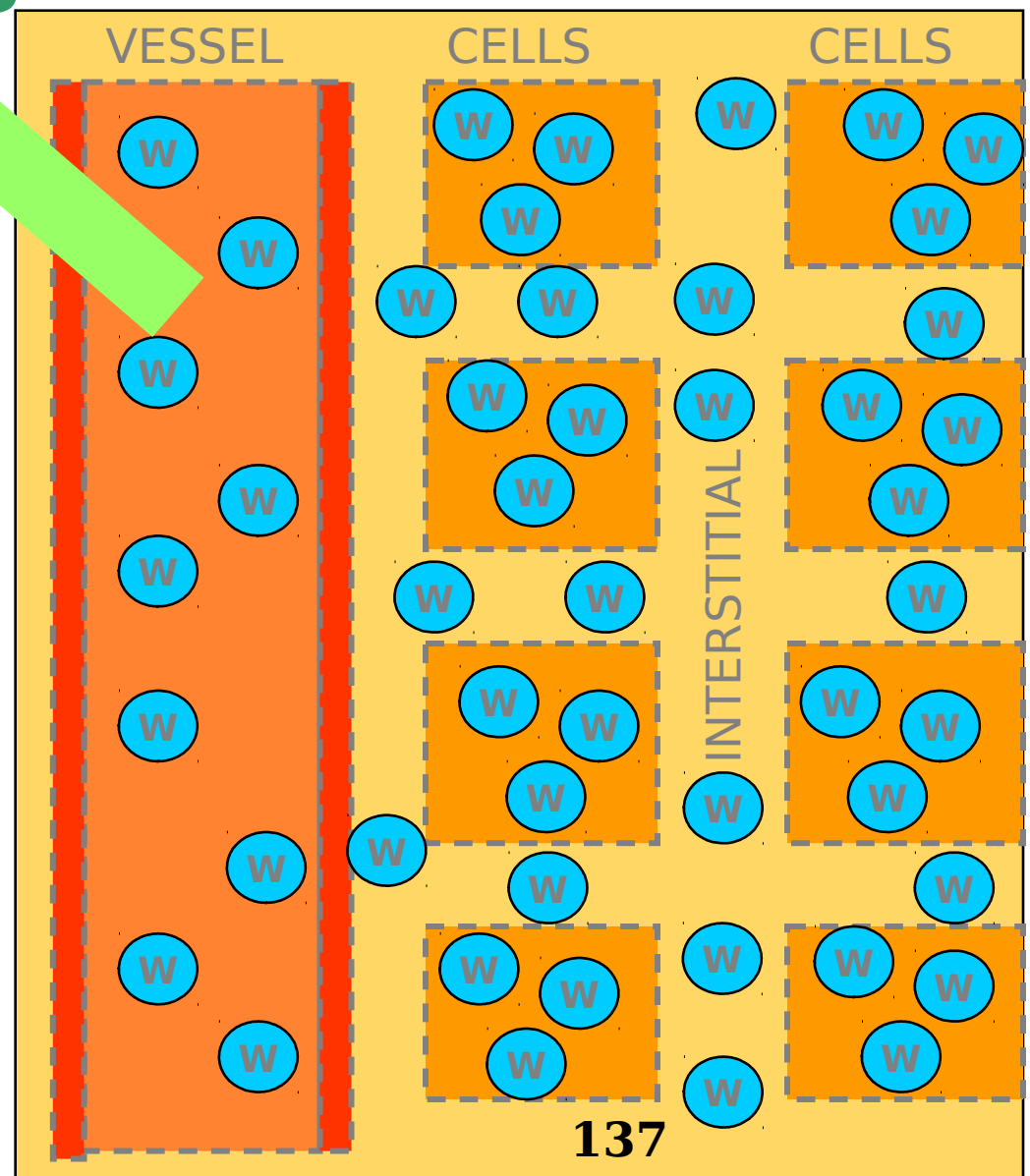




# Hextend® Fluid Shifts

W Water Molecules  
H Hextend Molecules

- Large Hextend particles remain in the vessels for 12 hours
- Osmotic pressure pulls additional water from the interstitial and intracellular spaces into the vessels
- The benefit from 500ml of Hextend is 800ml of blood





# Compare Fluids

- Max dose of Hextend is 1,000ml (1,600ml of volume expansion effect)
- To get the same effect from crystalloid, it requires 7,000ml PER CASUALTY!
- Which would you rather carry?
- Hextend is preferred as a weight saving advantage for combat trauma
- For hemorrhagic shock, LR is 2<sup>nd</sup> choice, normal saline is 3<sup>rd</sup>

**Hextend  
2.6 lbs**



**Crystalloid  
14.4 lbs**





# Fluid Resuscitation Strategy

- If signs of shock are present, ***CONTROL THE BLEEDING FIRST***, if at all possible.
  - Hemorrhage control takes precedence over infusion of fluids.
- Hextend, 500ml bolus initially
- If mental status and radial pulse improve, maintain saline lock – do not give additional Hextend.



# Fluid Resuscitation Strategy

- After 30 minutes, reassess state of consciousness and radial pulse. If not improved, give an additional 500ml of Hextend. ®
- Continued efforts to resuscitate must be weighed against logistical and tactical considerations and the risks of incurring further casualties.
- Hextend has no significant effects on coagulation and immune function at the recommended maximum volume of 140



# TBI Fluid Resuscitation

If a casualty with an altered mental status due to suspected TBI has a weak or absent peripheral pulse :

- Resuscitate with sufficient Hextend® to maintain a palpable radial pulse.
- Shock increases mortality in casualties with head injuries.
- Must give adequate IV fluids to restore adequate blood flow to brain.



# Questions?





# **Tactical Field Care Guidelines**

- 7. Prevention of hypothermia**
  - a. Minimize casualty's exposure to the elements. Keep protective gear on or with the casualty if feasible.**
  - b. Replace wet clothing with dry if possible. Get the casualty onto an insulated surface as soon as possible.**
  - c. Apply the Ready-Heat Blanket from the Hypothermia Prevention and Management Kit (HPMK) to the casualty's torso (not directly on the skin) and cover the casualty with the Heat-Reflective Shell (HRS).**





# **Tactical Field Care Guidelines**

## **7. Prevention of hypothermia (cont)**

- d. If an HRS is not available, the previously recommended combination of the Blizzard Survival Blanket and the Ready Heat blanket may also be used.**
- e. If the items mentioned above are not available, use dry blankets, poncho liners, sleeping bags, or anything that will retain heat and keep the casualty dry.**
- f. Warm fluids are preferred if IV fluids are required.**



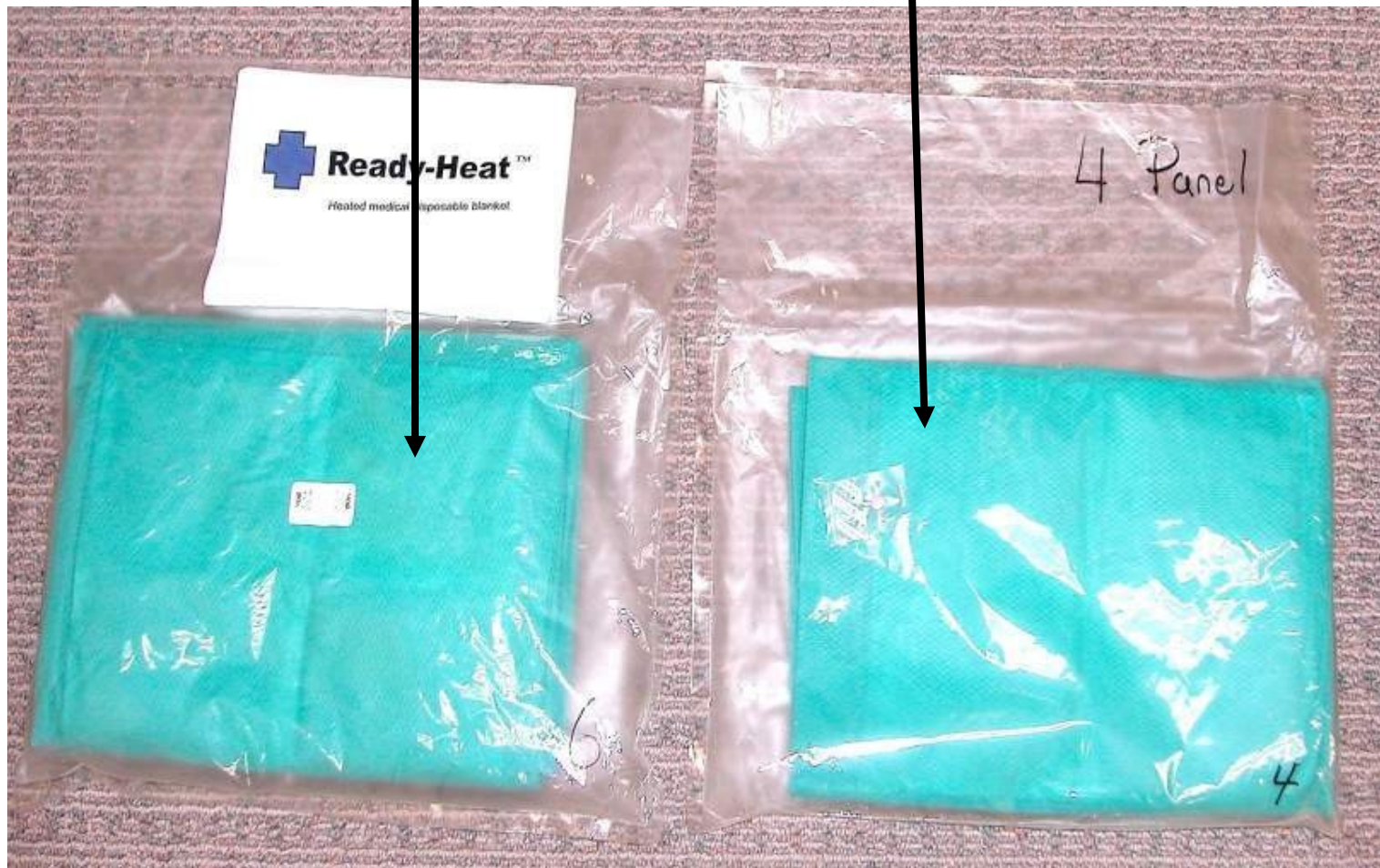
# THE OLD HPMK





**6 - Cell**  
***"Ready-Heat"***  
**Blanket**

**4- Cell**  
***"Ready-Heat"***  
**Blanket**



Apply Ready Heat blanket to torso **OVER** shirt





• **NEW HPMK**





# Hypothermia Prevention

- **Key Point: Even a small decrease in body temperature can interfere with blood clotting and increase the risk of bleeding to death.**
- Casualties in shock are unable to generate body heat effectively.
- Wet clothes and helicopter evacuations increase body heat loss.
- Remove wet clothes and cover casualty with hypothermia prevention gear.
- **Hypothermia is much easier to prevent than to treat!**



# **Tactical Field Care Guidelines**

## **8. Penetrating Eye Trauma**

**If a penetrating eye injury is noted or suspected:**

**a) Perform a rapid field test of visual acuity.**

**b) Cover the eye with a rigid eye shield (NOT a pressure patch.)**

**c) Ensure that the 400 mg moxifloxacin tablet in the**

**combat pill pack is taken if possible**

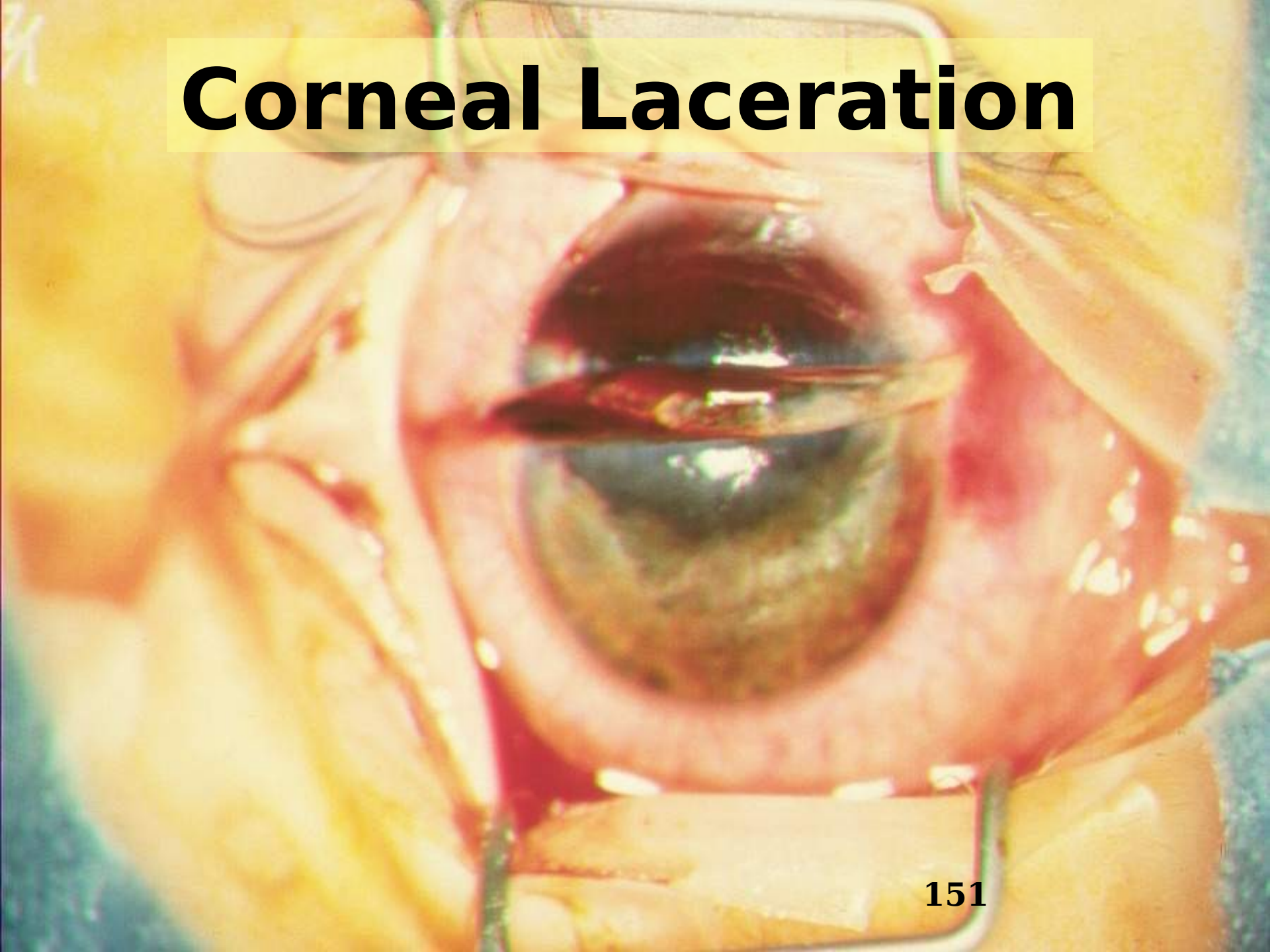


# Checking Vision in the Field

- Don't worry about charts
- Determine which of the following the casualty can see (start with "Read print" and work down the list if not able to do that.)
  - Read print
  - Count fingers
  - Hand motion
  - Light perception



# Corneal Laceration





**Small Penetrating Eye Injury**



**Protect the eye with a SHIELD, not a patch**





# Eye Protection



- Use your tactical eyewear to cover the injured eye if you don't have a shield.
- Using tactical eyewear in the field will generally prevent



Both injuries can result in eye infections  
that cause permanent blindness – GIVE  
ANTIBIOTICS!



# **Tactical Field Care Guidelines**

## **9. Monitoring**

**Pulse oximetry should be available as an adjunct to clinical monitoring. Readings may be misleading in the settings of shock or marked hypothermia.**



# Pulse Oximetry Monitoring

- Pulse oximetry – tells you how much oxygen is present in the blood
- Shows the heart rate and the percent of oxygenated blood (“O2 sat”) in the numbers displayed
- 98% or higher is normal O2 sat at sea level.
- 86% is normal at 12,000 feet – low oxygen pressure altitude







# Pulse Oximetry Monitoring

**Consider using a pulse ox for these types of casualties:**

- TBI – good O<sub>2</sub> sat very important for a good outcome
- Unconscious
- Penetrating chest trauma
- Chest contusion
- Severe blast trauma





# Pulse Oximetry Monitoring

**Oxygen saturation values may be inaccurate in the presence of:**

- Hypothermia
- Shock
- Carbon monoxide poisoning
- Very high ambient light levels





# Tactical Field Care Guidelines

**10. Inspect and dress known wounds.**

**11. Check for additional wounds.**





# Tactical Field Care Guidelines

**12. Provide analgesia as necessary.**

**a. Able to fight:**

***These medications should be carried by the combatant and self-administered as soon as possible after the wound is sustained.***

- Mobic, 15 mg PO once a day**
- Tylenol, 650-mg bilayer caplet, 2 caplets**

**PO every 8 hours**



# Tactical Field Care Guidelines

## 12. Provide analgesia as necessary.

**b. Unable to fight** (Does not otherwise require IV/IO

access) (*Note: Have naloxone readily available whenever*

administering opiates.)

**- Oral transmucosal fentanyl citrate (OTFC),**

**800ug transbuccally**

**- Recommend taping lozenge-on-a-stick to casualty's finger**

**as an added safety measure**

**- Reassess in 15 minutes**



# Tactical Field Care Guidelines

## **12. Provide analgesia as necessary.**

**b. Unable to fight** - IV or IO access obtained:

- **Morphine sulfate, 5 mg IV/IO**
  - Reassess in 10 minutes.
  - Repeat dose every 10 minutes as necessary to control severe pain.
  - Monitor for respiratory depression
- c. Promethazine, 25 mg IV/IM/IO every 6 hours**
- as needed for nausea or for



# Pain Control

## Pain Control When Able to fight:

- Mobic and Tylenol are the medications of choice
- Both should be packaged in a COMBAT PILL PACK and taken by the casualty as soon as feasible after wounding.
- **Mobic and Tylenol DO NOT cause a decrease in state of consciousness and DO NOT interfere with blood clotting.**
- Medications like aspirin, Motrin, and Toradol DO interfere with blood

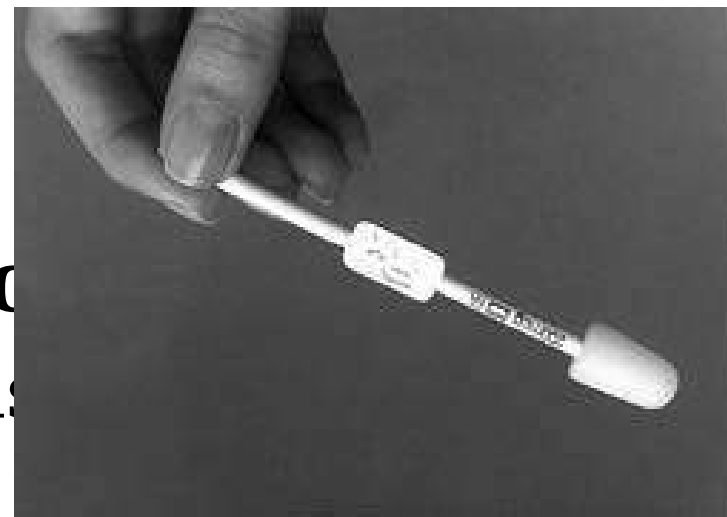




# Pain Control - Fentanyl Lozenge

## Pain Control - Unable to

- If casualty does not otherwise require IV/IO access



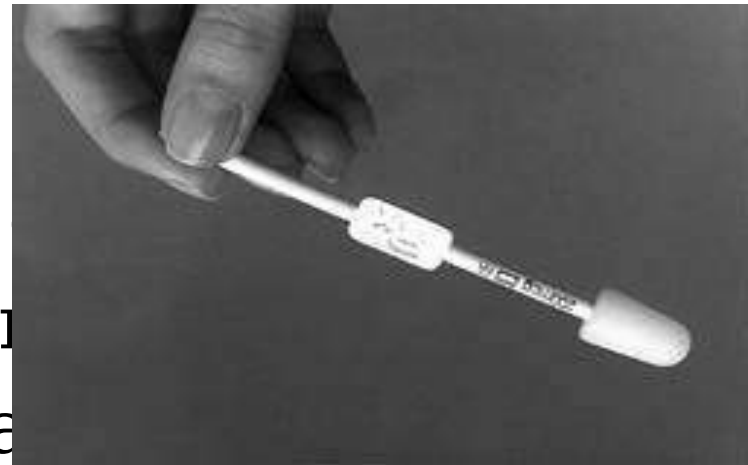
- Oral transmucosal fentanyl citrate, 800 µg (between cheek and gum)
- **VERY FAST-ACTING; WORKS ALMOST AS FAST AS IV MORPHINE**
- **VERY POTENT PAIN RELIEF**



# Pain Control - Fentanyl Lozenge

## Dosing and Precautions

- Tape fentanyl “lozenge a stick” to casualty’s firm surface as an added safety measure
- Re-assess in 15 minutes
- Add second lozenge in other cheek if needed
- Respiratory depression very unlikely – especially if only 1 lozenge is used
- Monitor for respiratory depression and hypoxemia (Narcosis) (0.4

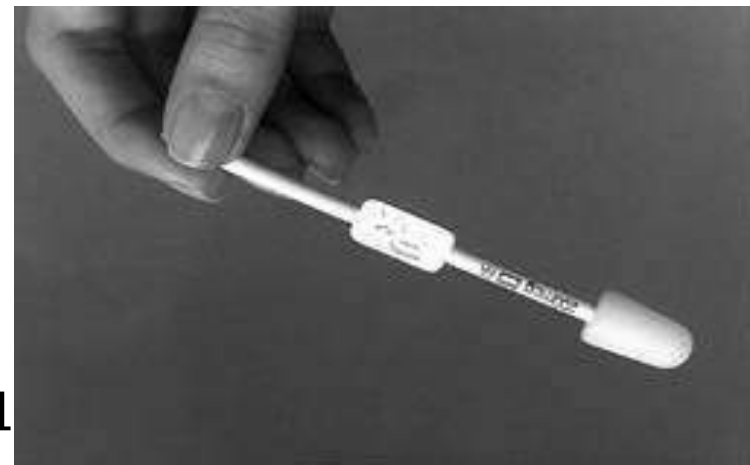




# Pain Control - Fentanyl Lozenges

## Safety Note:

- There is an FDA Safety Warning regarding the use of fentanyl lozenges in individuals who are not narcotic-tolerant.
- Multiple studies have demonstrated safety when used at the recommended dosing levels, BUT NOTE:



• **DON'T USE TWO WHEN ONE**



# Pain Control

## Pain Control - Unable to Fight

- If Casualty requires IV/IO access
  - Morphine 5 mg IV/IO
    - Repeat every 10 minutes as needed
    - **IV preferred to IM because of much more rapid onset of effect (1-2 minutes vice 45 minutes)**
  - Phenergan® 25mg IV/IM as needed for N&V
- Monitor for respiratory depression and have naloxone available



# Morphine Carpuject for IV (Intravenous) Use





# Morphine: IM Administration

- **IV/IO morphine given by medic/corpsman/PJ is preferred to IM- pain relief is obtained in 1-2 min instead of 45 minutes IM**
- Intramuscular injection is an alternative if no medic/corpsman/PJ is available to give it IV.
- Initial dose is 10 mg (one autoinjector)
- Wait 45 to 60 minutes before additional dose
- Attach auto injectors or put "M<sup>170</sup> on forehead to make each dose visible



# **Morphine Injector for IM (intramuscular) Injection**







# IM Morphine Injection Target Areas

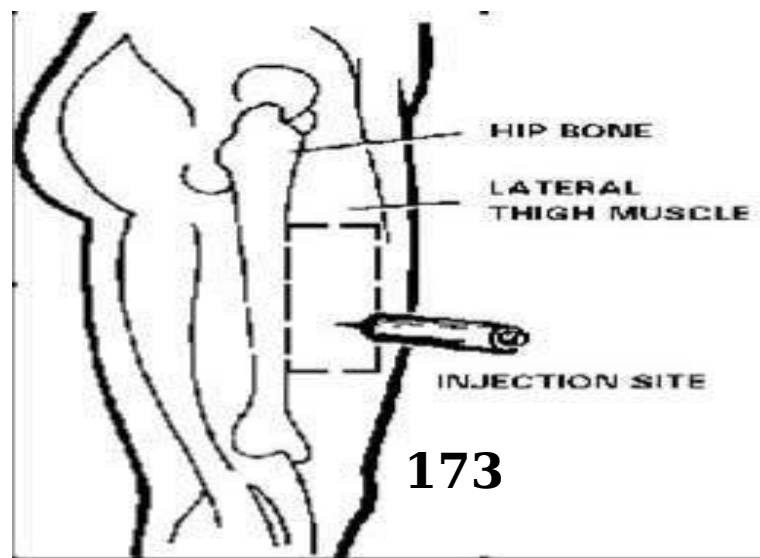
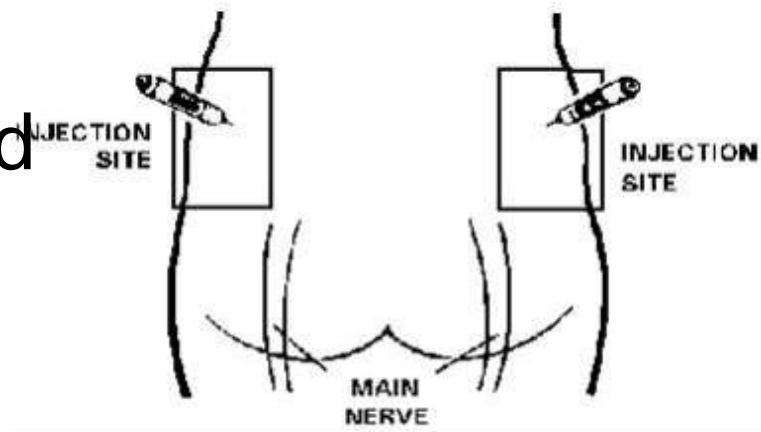
Triceps





# IM Morphine Injection Target Areas

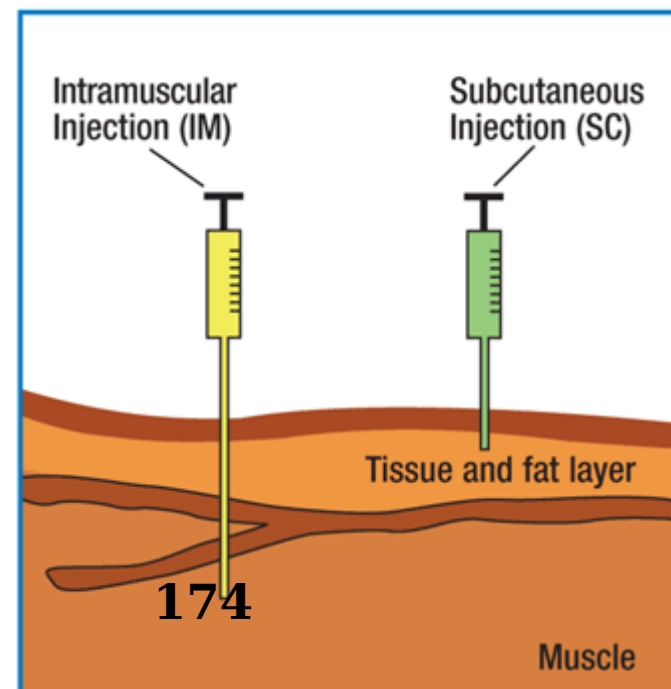
- Buttocks – Upper/outer quadrant to avoid nerve damage
- Anterior thigh





# IM Morphine Injection Technique Tips

- Expose injection site
- Clean injection site if feasible
- Squeeze muscle with other hand
- Auto-inject
  - Hold in place for 10 seconds
- Go all the way into the muscle as shown





# Warning: Morphine and Fentanyl

## Contraindications

- Hypovolemic shock
- Respiratory distress
- Unconsciousness
- Severe head injury
- **DO NOT give narcotics to casualties with these contraindications.**





# Pain Medications - Key Points!

- **Aspirin, Motrin, Toradol, and other nonsteroidal anti-inflammatory medicines (NSAIDs) other than Mobic should be avoided while in a combat zone because they interfere with blood clotting.**
- Aspirin, Motrin, and similar drugs inhibit platelet function for approximately 7-10 days after the last dose.
- **You definitely want to have your platelets working normally if you get shot.**
- Mobic and Tylenol DO NOT interfere with platelet function. <sup>176</sup> this is the



# Tactical Field Care Guidelines

## 13. Splint fractures and recheck pulse.







# Fractures:

## Open or Closed

- Open Fracture - associated with an overlying skin wound
- Closed Fracture - no overlying skin wound

**Open fracture**



**Closed fracture**







# Clues to a Closed Fracture

- **Trauma with significant pain**  
**AND**
- **Marked swelling**
- **Audible or perceived snap**
- **Different length or shape of limb**
- **Loss of pulse or sensation**  
**distal**



# Splinting Objectives

- **Prevent further injury**
- **Protect blood vessels and nerves**
  - **Check pulse before and after splinting**
- **Make casualty comfortable**





# Principles of Splinting

- **Check for other injuries**
- **Use rigid or bulky materials**
- **Try to pad or wrap if using rigid splint**
- **Secure splint with ace wrap, cravats, belts, duct tape**
- **Try to splint before moving casualty**



# Principles of Splinting

- **Minimize manipulation of extremity before splinting**
- **Incorporate joint above and below**
- **Arm fractures can be splinted to shirt using sleeve**
- **Consider traction splinting for mid-shaft femur fracture**
- **Check distal pulse and skin color before and after**





# Things to Avoid in Splinting

- **Manipulating the fracture too much and damaging blood vessels or nerves**
- **Wrapping the splint too tight and cutting off circulation below**





# Commercial Splints





# Field-Expedient Splint Materials

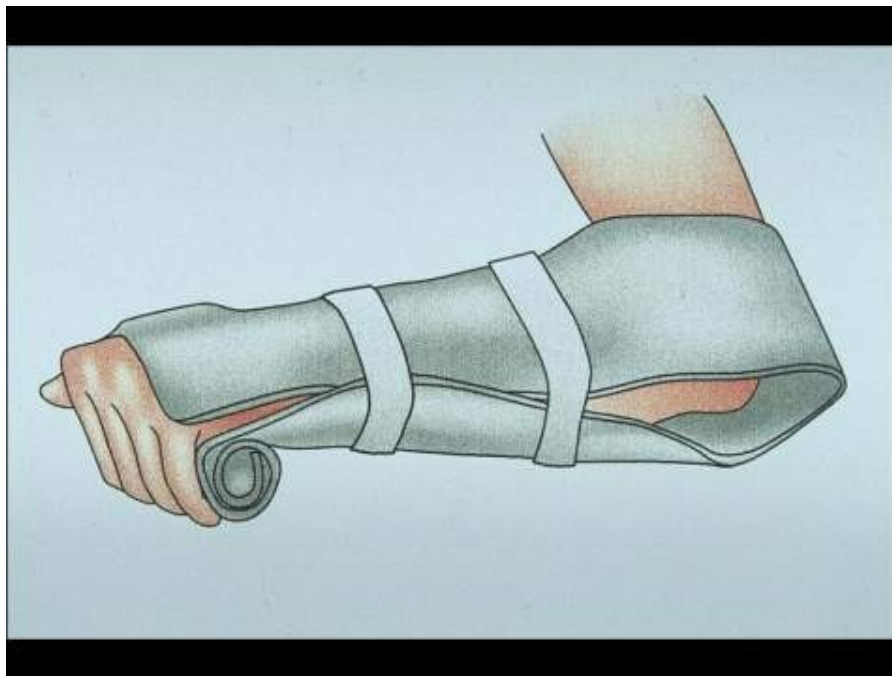
- **Shirt sleeves/safety pins**
- **Weapons**
- **Boards**
- **Boxes**
- **Tree limbs**
- **ThermaRest pad**







# **Don't Forget!**



**Pulse, motor and sensory checks  
before and after splinting**



# Splinting Practical





# **Tactical Field Care Guidelines**

**14. Antibiotics - recommended for all open combat wounds:**

**a. If able to take PO meds:**

**- Moxifloxacin, 400 mg PO one a day**

**b. If unable to take PO (shock, unconsciousness):**

**- Cefotetan, 2 g IV (slow push over 3-5 minutes)**

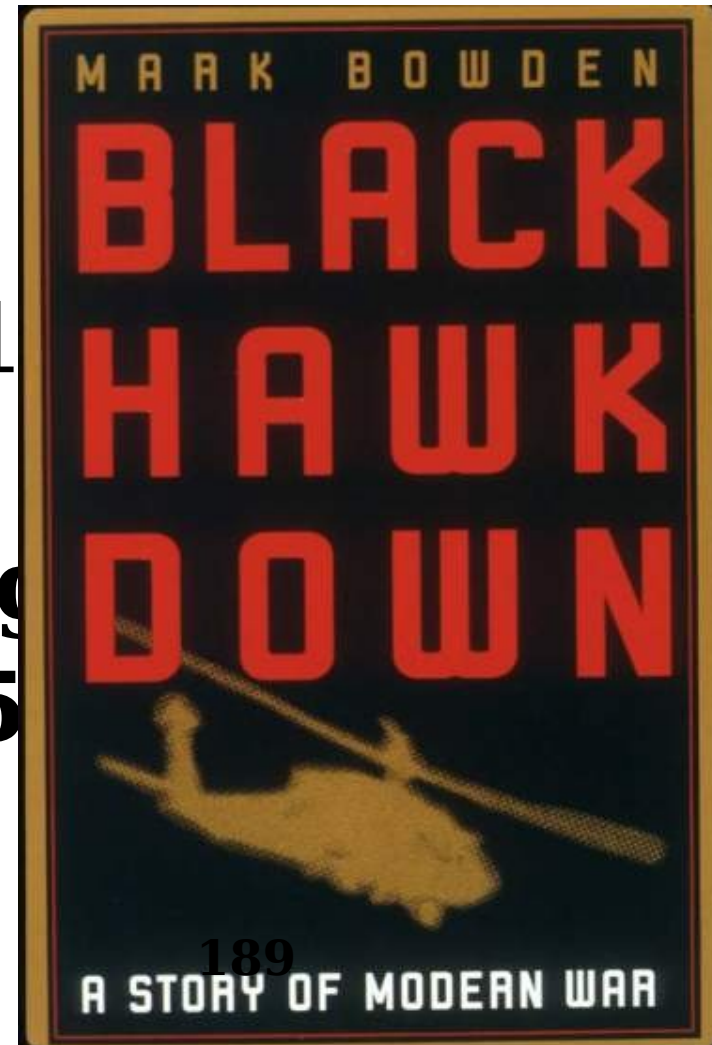
**or IM every 12 hours**



# Outcomes: Without Battlefield Antibiotics

- **Mogadishu 1993**
- **Casualties: 58**
- **Wound Infections: 1**
- **Infection rate: 28%**
- **Time from wounding to Level II care - 15**

*Mabry et al  
J Trauma 2000*





# **Outcomes: With Battlefield Antibiotics**

**Tarpey - AMEDD J 2005:**

- 32 casualties with open wounds**
- All received battlefield antibiotics**
- None developed wound infections**
- Used TCCC recommendations modified by availability:**
  - Levofloxacin for an oral antibiotic**
  - IV cefazolin for extremity injuries**



# **Outcomes: With Battlefield Antibiotics**

- **MSG Ted Westmoreland**
- **Special Operations Medical Association presentation 2004**
- **Multiple casualty scenario involving 19 Ranger and Special Forces WIA as well as 30 Iraqi WIA**
- **11- hour delay to hospital care**
- **Battlefield antibiotics given**
- **No wound infections developed in this group.**





# Battlefield Antibiotics



**Recommended for all open wounds on the battlefield!**





# Battlefield Antibiotics

**If casualty can take PO meds**

- **Moxifloxacin 400 mg**, one tablet daily
  - Broad spectrum – kills most bacteria
  - Few side effects
  - Take as soon as possible after life-threatening conditions have been addressed
  - Delays in antibiotic administration increase the risk of wound infections



# Combat Pill Pack

In the event of open combat wound  
swallow all four pills with water.

**Mobic 15mg**  
**Tylenol ER 650mg, 2 caplets**  
**Moxifloxacin 400mg**



Pain Management and Infection Control  
For Combat Casualties  
194  
*"Just Got Easier To Swallow"*



# Battlefield Antibiotics

- Casualties who cannot take PO meds
  - Ertapenem 1 gm IV/IM once a day
    - IM should be diluted with lidocaine (1 gm vial ertapenem with 3.2cc lidocaine without epinephrine)
    - IV requires a 30-minute infusion time
- NOTE: Cefotetan is also a good alternative, but has been more difficult to obtain through supply channels





# Medication Allergies

- **Screen your units for drug allergies!**
- Patients with allergies to aspirin or other non-steroidal anti-inflammatory drugs should not use Mobic.
- Allergic reactions to Tylenol are uncommon.
- Patients with allergies to flouroquinolones, penicillins, or cephalosporins may need alternate antibiotics which should be selected by unit medical personnel during the pre-deployment phase. **Check with your**



# Treatment of Burns in TCCC

## 15. Burns

- a. Facial burns, especially those that occur in closed spaces, may be associated with inhalation injury. Aggressively monitor airway status and oxygen saturation in such patients and consider early surgical airway for respiratory distress or oxygen desaturation.
- b. Estimate total body surface area (TBSA) burned to the full thickness of the skin using the Rule of Nines. (see slide 197)



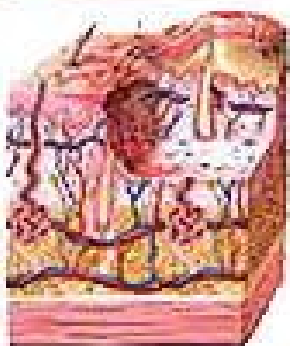


# Three Degrees of Burns

Epidermis  
Dermis  
Subcutaneous  
Muscle



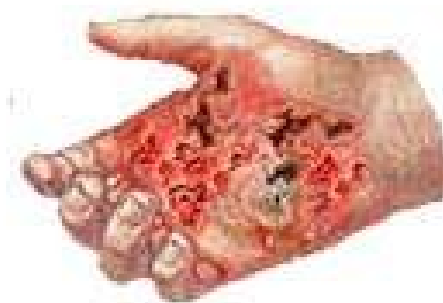
Superficial  
(first degree)  
burn



Partial thickness  
(second degree)  
burn



Full thickness  
(third degree)  
burn





# Degrees of Burns

Superficial burn



Partial thickness burn



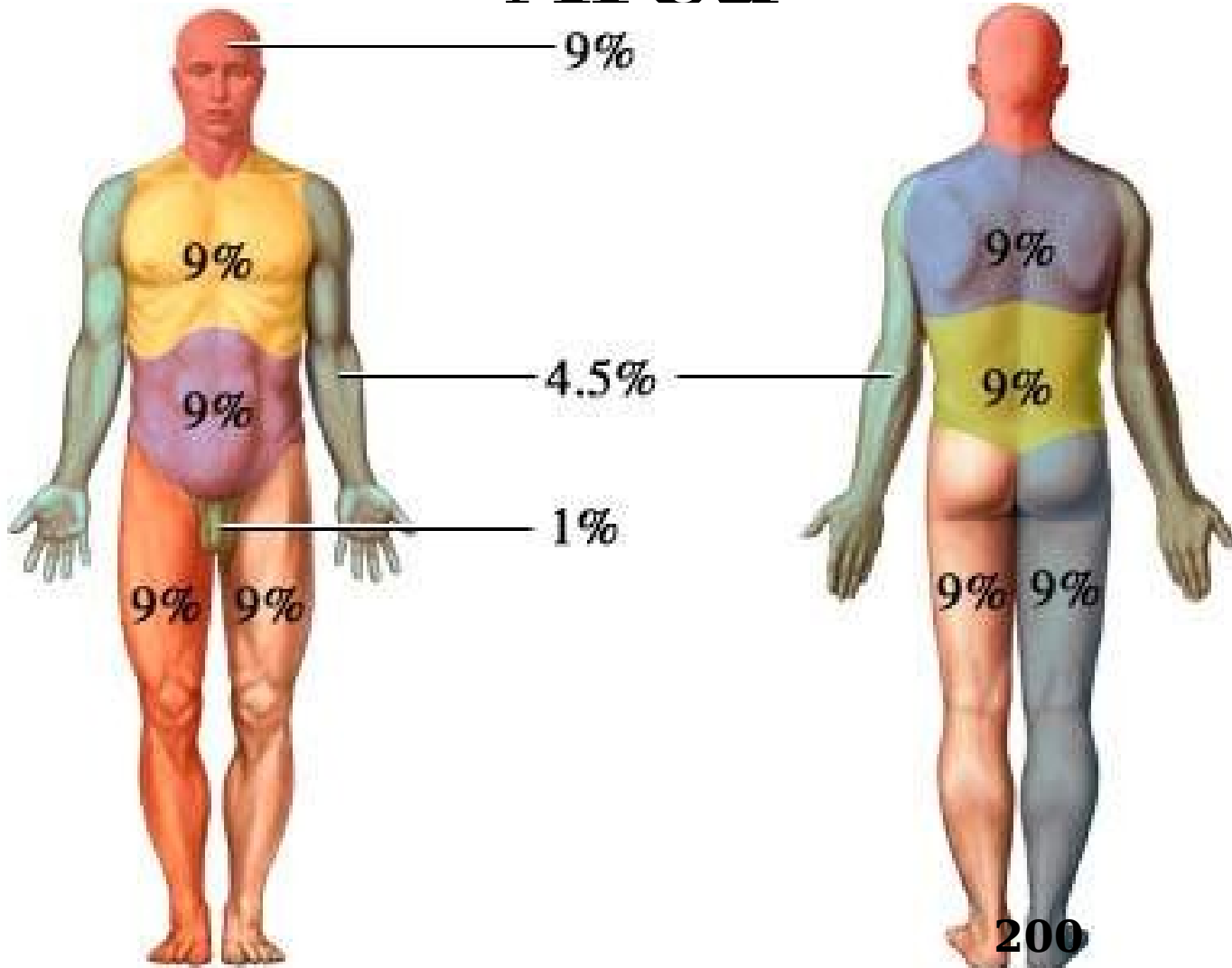
Full-thickness burn







# Rule of Nines for Calculating Burn Area





# Treatment of Burns in TCCC

## 15. Burns (cont)

- c. Cover the burn area with dry, sterile dressings. For extensive burns ( $>20\%$ ), consider placing the casualty in the HRS or the Blizzard Survival Blanket in the Hypothermia Prevention order to both cover the burned and prevent hypothermia.





# Treatment of Burns in TCCC

## 15. Burns (cont)

### d. Fluid resuscitation (USAISR Rule of Ten)

- If **burns are greater than 20%** of Total Body Surface Area, fluid resuscitation should be initiated as soon as IV/IO access is established. **Resuscitation should be initiated with Lactated Ringer's, normal saline, or Hextend. If Hextend is used, no more than 1000 ml should be given, followed by**



# Treatment of Burns in TCCC

## 15. Burns (cont)

- **Initial IV/IO fluid rate is calculated as %TBSA x 10cc/hr for adults weighing 40-80 kg.**
- **For every 10 kg ABOVE 80 kg, increase initial rate by 100 ml/hr.**
- **If hemorrhagic shock is also present, resuscitation for hemorrhagic shock takes precedence over resuscitation for burn shock. Administer IV/IO fluids per the TCCC Guidelines<sup>203</sup> in**



# **Treatment of Burns in TCCC**

## **15. Burns (cont)**

- e. Analgesia in accordance with TCCC Guidelines in Section 12 may be administered to treat burn pain.**
- f. Prehospital antibiotic therapy is not indicated solely for burns, but antibiotics should be given per TCCC guidelines in Section 14 if indicated to prevent infection in penetrating wounds.**



# Treatment of Burns in TCCC

## 15. Burns (cont)

- g. **All TCCC interventions can be performed on or through burned skin in a burn casualty.**

*casualties are “Trauma  
lties with burns” - not the other  
round*

*US Army ISR Burn Center*





# **Tactical Field Care Guidelines**

## **16. Communicate with the casualty if possible.**

- Encourage; reassure**
- Explain care**







# **Tactical Field Care Guidelines**

## **17. Cardiopulmonary resuscitation (CPR):**

**Resuscitation on the  
battlefield for**

**victims of blast or  
penetrating**

**trauma who have no pulse,  
no**

**ventilations, and no<sup>20</sup> other**



# CPR



**NO battlefield CPR**



# CPR in Civilian Trauma

- 138 trauma patients with prehospital cardiac arrest and in whom resuscitation was attempted.
- No survivors
- Authors recommended that trauma patients in cardiopulmonary arrest not be transported emergently to a trauma center even in a civilian setting due to large economic cost of treatment without a significant chance for survival.

209

*Rosemurgy et al. J Trauma 1993*



# **The Cost of Attempting CPR on the Battlefield**

- **CPR performers may get killed**
- **Mission gets delayed**
- **Casualty stays dead**



# **CPR on the Battlefield (Ranger Airfield Operation in Grenada)**

- Airfield seizure operation
- Ranger shot in the head by sniper
- No pulse or respirations
- CPR attempts unsuccessful
- Operation delayed while CPR performed
- Ranger PA finally intervened:  
“Stop CPR and move out!”<sup>211</sup>



# CPR in Tactical Settings

Only in the case of cardiac arrests from:

- Hypothermia
- Near-drowning
- Electrocution
- Other non-traumatic causes

should CPR be considered prior to the

Tactical Evacuation Care phase.



# **Tactical Field Care Guidelines**

## **18. Documentation of Care:**

**Document clinical assessments,**

**treatments rendered, and changes in**

**the casualty's status on a TCCC**

**Casualty Card. Forward this information with the<sup>213</sup>**





# TCCC Casualty Card

- Designed by combat medics
- Used in combat since 2002
- Replaces DD Form 1380
- Only essential information
- Can be used by hospital to document injuries sustained and field treatments rendered
- Heavy-duty waterproof or laminated paper

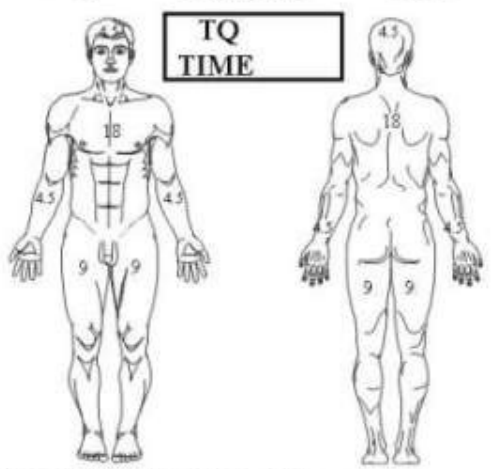


# TCCC Casualty Card

Name/ID: \_\_\_\_\_

DTG: \_\_\_\_\_ ALLERGIES: \_\_\_\_\_

Friendly      Unknown      NBC



GSW BLAST MVA Other \_\_\_\_\_

TIME				
AVPU				
PULSE				
RESP				
BP				

DD FORM XXXX (Tactical Combat Casualty Care Card)

A: Intact    Adjunct    Cric    Intubated

B: Chest Seal    NeedleD    ChestTube

C: TQ    Hemostatic    Packed    PressureDx  
IV    IO

FLUIDS:    NS / LR    500    1000    1500  
                 Hextend    500    1000

Other: \_\_\_\_\_

DRUGS (Type / Dose / Route):

PAIN

ABX

OTHER

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Medic's Name \_\_\_\_\_

Thanks to the 75<sup>th</sup> Ranger



# TCCC Casualty Card

- This card is based on the principles of TCCC.
- The TCCC Casualty Card addresses the initial lifesaving care provided at the point of wounding. Filled out by whoever is caring for the casualty.
- Its format is simple with a circle or “X” in the appropriate block.



# Instructi ons

- Follow the instructions on the following slides for how to use this form.
- This casualty card should be in each Individual First Aid Kit.
- Use an indelible marker to fill it out
- Attach it to the casualty's belt loop, or place it in their upper left sleeve, or the left trouser cargo pocket



# TCCC Card Front

Individual's  
name and  
allergies  
should  
already be  
filled  
in. This should  
be  
done when

**Name/Unit** \_\_\_\_\_

DTG: \_\_\_\_\_ **ALLERGIES** \_\_\_\_\_

Friendly      Unknown      NBC

4.5  
18  
9 1 9  
4.5

**TQ  
TIME**

4.5  
18  
9 9  
4.5

GSW BLAST MVA Other \_\_\_\_\_

<b>TIME</b>				
<b>AVPU</b>				
<b>PULSE</b>				
<b>RESP</b>				
<b>BP</b>				

DA FORM 7656, XXX ###



# TCCC Card

## Front

- Add date-time group
- Cause of injury, and whether friendly, unknown, or NBC.

Name/Unit \_\_\_\_\_

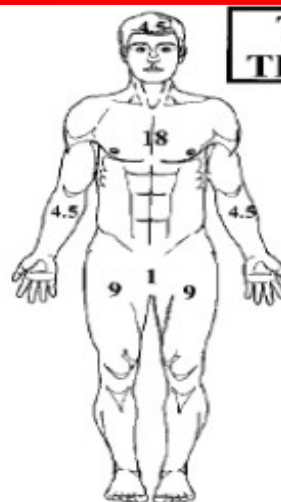
DTG: \_\_\_\_\_

ALLERGIES: \_\_\_\_\_

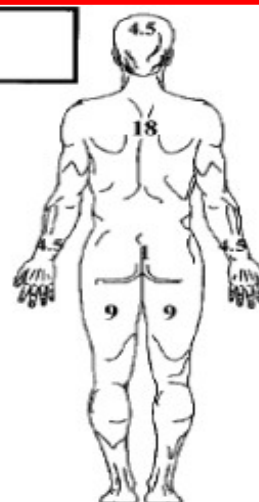
Friendly

Unknown

NBC



TQ  
TIME



GSW BLAST MVA Other \_\_\_\_\_

TIME

AVPU

PULSE

RESP

BP


DA FORM 7656, XXX #8888



# TCCC Card

## Front

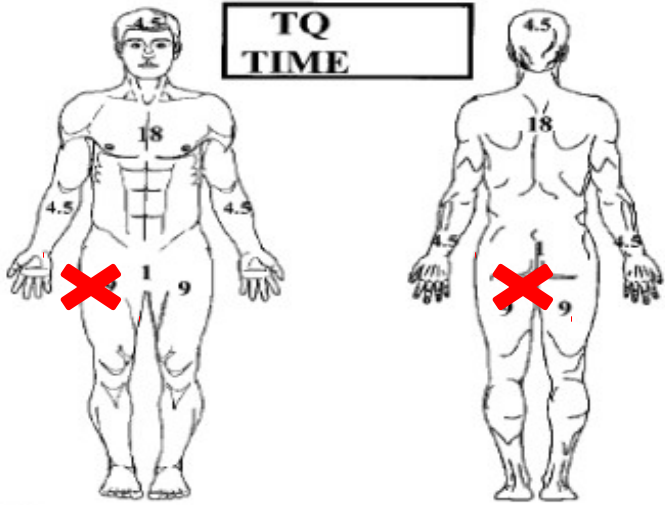
- Mark an “X” at the site of the injury/ie on body picture.
- Note burn percentages on figure

Name/Unit \_\_\_\_\_

DTG: \_\_\_\_\_ ALLERGIES: \_\_\_\_\_

Friendly      Unknown      NBC

TQ  
TIME



GSW BLAST MVA Other \_\_\_\_\_

TIME				
AVPU				
PULSE				
RESP				
BP				





# TCCC Card Front

- Record casualty's level of consciousness and vital signs with time.

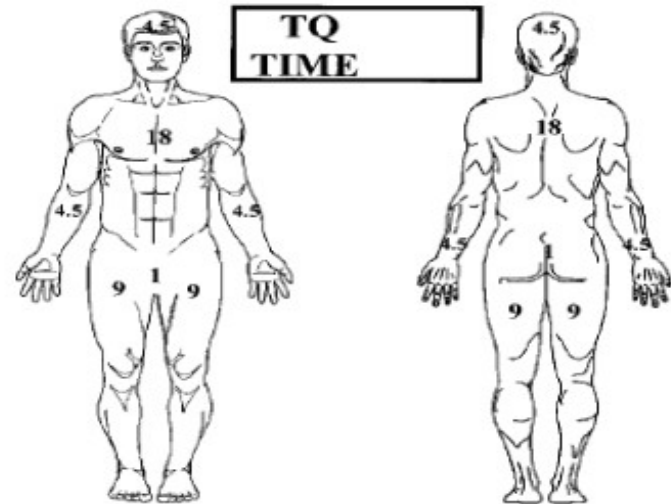
Name/Unit \_\_\_\_\_

DTG: \_\_\_\_\_ ALLERGIES: \_\_\_\_\_

Friendly

Unknown

NBC



GSW BLAST MVA Other \_\_\_\_\_

TIME				
AVPU				
PULSE				
RESP				
BP				



# TCCC Card

## Back

- Record airway interventions.

Intact Adjunct Cric Intubated

Chest Seal NeedleD ChestTube

TQ Hemostatic Packed PressureDrsg

---

LUIDS: IV IO

NS / LR 500 1000 1500

Hextend 500 1000

ther:

---

RUGS (Type / Dose / Route):

IN

IX

HER

irst Responder's Name



# TCCC Card

## Back

- Record breathing interventions.

Intact Adjunct Cric Intubated  
Chest Seal NeedleD ChestTube  
TQ Hemostatic Packed PressureDrsg

LUIDS: IV IO  
NS / LR 500 1000 1500  
Hextend 500 1000

ther:  
RUGS (Type / Dose / Route):  
IN  
BX  
THER  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

First Responder's Name \_\_\_\_\_



# TCCC Card Back

- Record bleeding control measures; don't forget tourniquet time on front of card.

Intact Adjunct Cric Intubated

Chest Seal Needled ChestTube

TQ Hemostatic Packed PressureDrsg

FLUIDS: IV IO

NS / LR 500 1000 1500

Hextend 500 1000

ther:

RUGS (Type / Dose / Route):

IN

EX

HER

First Responder's Name



# TCCC Card Back

- Record route of fluid, type, and amount given.

Intact Adjunct Cric Intubated

Chest Seal NeedleD ChestTube

TQ Hemostatic Packed PressureDrsg

FLUIDS: IV IO

NS / LR 500 1000 1500

Hextend 500 1000

Other:

DRUGS (Type / Dose / Route):

IN

IX

OTHER

First Responder's Name \_\_\_\_\_



# TCCC Card Back

- Record any drugs given: pain meds, antibiotics, or other.

Intact Adjunct Cric Intubated

Chest Seal NeedleD ChestTube

TQ Hemostatic Packed PressureDrsg

FLUIDS: IV IO

NS / LR 500 1000 1500

Hextend 500 1000

Other:

DRUGS (Type / Dose / Route):

AN

SK

OTHER

First Responder's Name \_\_\_\_\_



# TCCC Card Back

- Record any pertinent notes.

• Intact Adjunct Cric Intubated

• Chest Seal NeedleD ChestTube

• TQ Hemostatic Packed PressureDrsg

---

LUIDS: IV IO

NS / LR 500 1000 1500

Hextend 500 1000

ther:

---

RUGS (Type / Dose / Route):

IN

IX

HER

---

---

---

---

---

---

---

---

irst Responder's Name \_\_\_\_\_





# TCCC Card Back

- Sign card.
- Does not have to be a medic or corpsman to sign

• Intact Adjunct Cric Intubated  
• Chest Seal NeedleD ChestTube  
• TQ Hemostatic Packed PressureDrsg

---

LUIDS: IV IO  
NS / LR 500 1000 1500  
Hextend 500 1000

ther: \_\_\_\_\_

RUGS (Type / Dose / Route):

IN \_\_\_\_\_

IX \_\_\_\_\_

HER \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

First Responder's Name \_\_\_\_\_



# Documentation

- Record each specific intervention in each category.
- If you are not sure what to do, the card will prompt you where to go next.
- Simply circle the intervention you performed.
- Explain any action you want clarified in the remarks area.



# Documentation

- The card does not imply that every casualty needs all of these interventions.
- You may not be able to perform all of the interventions that the casualty needs.
- The next person caring for the casualty can add to the interventions performed.
- This card can be filled out in less than two minutes.
- It is important that we document the care given to the casualty



# TCCC Card Abbreviations

- DTG = Date-Time Group (e.g. - 160010Oct2009)
- NBC = Nuclear, Biological, Chemical
- TQ = Tourniquet
- GSW = Gunshot Wound
- MVA = Motor Vehicle Accident
- AVPU = Alert, Verbal stimulus, Painful stimulus, Unresponsive
- Cric = Cricothyroidotomy
- NeedleD = Needle decompression
- IV = Intravenous
- IO = Intraosseous
- NS = Normal Saline
- LR = Lactated Ringers
- ABX = Antibiotics

# Question ?





# Further Elements of Tactical Field Care

- Reassess regularly
- Prepare for transport
- Minimize removal of uniform and protective gear, but get the job done
- Replace body armor after care, or at least keep it with the casualty. He or she may need it again if there is additional contact.<sup>233</sup>



# Further Elements of Tactical Field Care

Casualty movement in TFC may be better accomplished using litters.

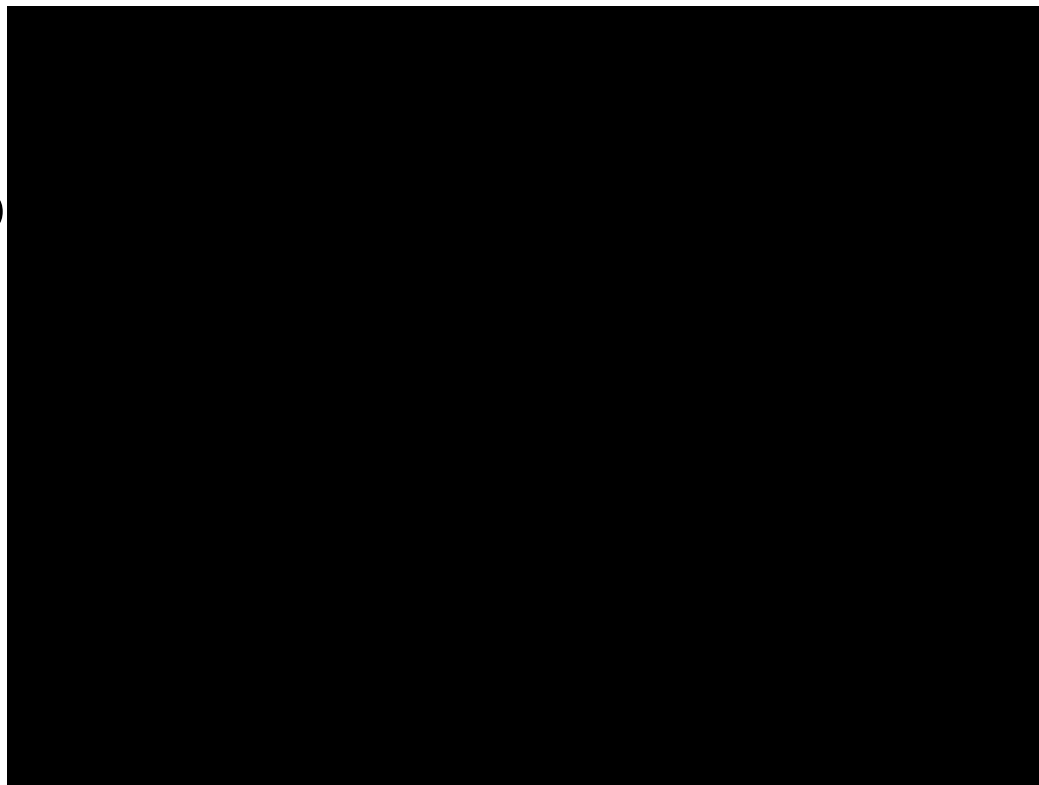






# Litter Carry Video

- Secure the casualty on the litter
- Bring his weapons
- Click to start video





# Summary of Key Points

- Still in hazardous environment
- Limited medical resources
- Hemorrhage control
- Airway management
- Breathing
- Transition from tourniquet to another form of hemorrhage control when appropriate
- Hypotensive resuscitation with Hextend for hemorrhagic shock
- Hypothermia prevention



# Summary of Key Points

- Shield and antibiotics for penetrating eye injuries
- Pain control
- Antibiotics
- Reassure casualties
- No CPR
- Documentation of care



# Question #2



**Wear your body armor!**





# Management of Wounded Hostile Combatants





# Objective

- DESCRIBE the considerations in rendering trauma care to wounded hostile combatants.







# Care for Wounded Hostile Combatants

- No medical care during Care Under Fire
- Though wounded, enemy personnel may still act as hostile combatants.
  - May employ any weapons or detonate any ordnance they are carrying
- **Enemy casualties are hostile combatants until they:**
  - **Indicate surrender**
  - **Drop all weapons**
  - **Are proven to no longer pose a threat**





# Care for Wounded Hostile Combatants

- **Combat medical personnel should not attempt to provide medical care until sure that wounded hostile combatant has been rendered safe by other members of the unit.**
- Restrain with flex cuffs or other devices if not already done.
- Search for weapons and/or ordnance.
- Silence to prevent communication with other hostile combatants.



# Care for Wounded Hostile Combatants

- Segregate from other captured hostile combatants.
- Safeguard from further injury.
- **Care as per TFC guidelines for U.S. forces after above steps are accomplished.**
- Speed to the rear as medic and tactically feasible



# ***QUESTIONS ?***







# Convoy IED Scenario

- Recap from Care under Fire
- Your last medical decision during Care Under Fire:
  - Placed tourniquet on bleeding stump
- You moved the casualty behind cover and returned fire.
- If it was possible, you provided an update to your mission



# Convoy IED Scenario

## **Assumptions in discussing TFC care in this scenario:**

- Effective hostile fire has been suppressed.
- Team Leader has directed that the unit will move.
- Pre-designated HLZ for helicopter evacuation is 15 minutes away.
- Flying time to hospital is 30 minutes.
- Ground evacuation time is 3 hours.
- Enemy threat to helicopter at HLZ estimated to be minimal.



# Convoy IED Scenario

Next decision?

- How to evacuate casualty?
  - Helicopter
    - Longer time delay for ground evacuation
    - Enemy threat at HLZ acceptable



# Convoy IED Scenario

Next decision?

- Load first and treat enroute to HLZ or treat first and load after?
  - Load and Go
  - Why?
    - Can continue treatment enroute
    - Avoid potential second attack at ambush site





# Convoy IED Scenario

Next decision?

- Do you need spinal immobilization?
- Not unless casualty has neck or back pain
  - Why?
  - Low expectation of spinal fracture in the absence of neck or back pain in a conscious casualty
  - Speed is critical



# Convoy IED Scenario

Casualty and medical provider are in vehicle enroute to HLZ.

Next action?

- Reassess casualty
  - Casualty is now unconscious
  - No bleeding from first tourniquet site
  - Other stump noted to have severe bleeding



# Convoy IED Scenario

- Next action?
  - Place tourniquet on 2<sup>nd</sup> stump
- Next action?
  - Remove any weapons or ordnance that the casualty may be carrying.

- Next action?
  - Place nasopharyngeal airway

Next action?

- Make sure he's not bleeding heavily elsewhere

Check for other trauma



# Convoy IED Scenario

- Next action?
  - Establish IV access - need to resuscitate for shock
- Next action?
  - Infuse 500cc Hextend
- Next actions
  - Hypothermia prevention
  - IV antibiotics
  - Pulse ox monitoring
  - Continue to reassess casualty



# Remember

- **The TCCC guidelines are not a rigid protocol.**
- **The tactical environment may require some modifications to the guidelines.**
- **Think on your feet!**





# Questions?





# Back-Up Slides





# Pyng FAST Removal (1)

1. Stabilize target patch with one hand
2. Remove dome with the other





# Pyng FAST Removal (2)

3. Terminate IV fluid flow
4. Disconnect infusion tube





# Pyng FAST Removal (3)

5. Hold infusion tube perpendicular to manubrium
6. Maintain slight negative pressure on infusion tube
7. Insert remover while continuing to





# Pyng FAST Removal (4)

9. This is a threaded device
10. Turn it clockwise until remover no longer turns
11. This engages remover into metal (proximal) end of the infusion tube
12. Gentle counterclockwise





# Pyng FAST Removal (5)

13. Remove infusion tube
14. Use only "T" shaped knob and pull perpendicular to manubrium
15. Hold target patch during removal
16. DO NOT pull on the Luer fitting or the tube itself





# Pyng FAST Removal (6)

17. Remove target patch





# Pyng FAST Removal (7)

18. Dress infusion site using aseptic technique
19. Dispose of remover and infusion tube using contaminated sharps protocol







# Pyng FAST Removal (8)

- Problems encountered during removal
  - Performed properly...should be none!
- If removal fails or proximal metal ends separate:
  - Make incision
  - Remove using clamp
  - This is a “serious injury”<sup>263</sup> as